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PROGRAM FOR TENTH NATIONAL (VICTORY) ASSEMBLY UNITED STATES CHAPTER INTERNATIONAL COLLEGE OF SURGEONS

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Original Articles

Ten Years' Experience with the Surgical Treatment of Pulmonary Tuberculosis[1]

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GREATLY impressed by the high mortality attending total and subtotal paravertebral thoracoplasty of Sauerbruch, I tried during the first few years to arrive at a less severe method with the aid of plombage. At first I performed these operations more as a provisional plombage, combined with a partial thoracoplasty and a loosening of the upper portion of the lung. As so often happens, I quite undeservedly had the gratification of witnessing a substantial improvement in results rendering it possible to continue the surgical treatment, which had not at first been considered possible.

I must admit, however, that I have subsequently seldom observed a like satisfactory result among the 37 plombage operations I have performed. The reason for this has only recently occurred to me in connection with the technic I have hit upon for cases in which the indications are more or less dubious and the prognosis is difficult to assess, especially as regards the immediate mortality risk. Under these circumstances it has become clear that what I had done in the first case was nothing but a form of *thoracoplasty in stages, combined with a temporary plombage,* i.e., just the form of operative technic that Walter Schmidt has so zealously practiced at the sanatorium for the surgical treatment of pulmonary tuberculosis at Rohrbach, near Heidelberg. The difference is merely that I have worked from the back of the chest, whereas Schmidt consistently did his first stage from the front. After studies under Sauerbruch and others I adopted a much more *definite plombage,* which did not permit of a continuation of the operation, at any rate not without involving great difficulties for the surgeon and increased risks for the patient. *In other words, the greatest drawback of plombage, and that which makes the method inadvisable in this form, is the difficulty, not to say the impossibility, of continuing the collapse therapy if such should be found necessary.*

A follow-up examination of all our plombage cases was undertaken at the end of 1940, with the result indicated in the accompanying table. It should not be regarded as too discouraging, seeing that very many of the cases composing the material were prognostically unfavorable ones, the first period including several severe bilateral cases which,

TABLE

PLOMBAGE BY SAUERBRUCH-BAER'S TECHNIC

Number of patients	37	
Operative mortality (4 wks.)	0	
Total mortality	16	= 43,00 %
Of them, after thoracoplasty	7	= 18,92 %
Tb.—negative patients, 1940	17	= 45,95 %
Of them, capable of work	14	= 38,00 %
Tb.—positive patients	4	= 10,81 %

according to our present experiences, ought never to have been operated on. For some of these patients it has meant increased hope of future health, and from this point of view I may be permitted to say that the operation was to some extent justifiable.

In fact, I am still convinced that in a certain limited number of cases a definite plombage is indicated, although as a way out of our difficulties for more general use it has disappointed our hopes, at all events in the form it has hitherto been practiced. The most important cause of this failure, it seems to me, is that *in those cases in which plombage has failed to achieve its object, there has been no means of removing the plug in a simple and safe way and continuing the operation.*

I can, however, acquiesce to some extent in what Kremer writes about plombage in *Kollapstherapie der Lungentuberkulose*, viz., "The pronounced favorable effect of the plombage operation in predominantly unilateral cirrhotic tuberculosis for which a thoracoplasty is not possible will always give it an assured place in collapse therapy. Moreover, it justifies the employment of an upper lobe plombage in many cases for which thoracoplasty is *per se* not contra-indicated. The slight risk and the smaller degree of disfigurement associated with it also speak in favor of plombage."

The methods published by Holst and Semb, of Oslo, and consisting essentially of an extra-fascial apicolysis undoubtedly aroused fresh hope in many, especially as the strict division of the operation into stages gave promise of reducing the mortality. These methods have proved a disappointment to me, possibly on account of deficient technic and insufficient experience with the procedure. Certain complications have become more accentuated after these measures, this applying more especially to that sometimes severe infection in the soft parts and in the extrapleural wound-cavity which does not seem to follow the usual laws of post-operative wound infection. Nor has the final collapse after these operations, when performed in stages, been so satisfactory as could be desired. In certain cases the result has been extremely good, this applying in particular to the rather early, mild, stage of this operation, which consists of plombage after resection of one, two, or at most three of the uppermost ribs on the ventral side. At the second stage six or seven ribs, at times even eight, are resected on the dorsal side, *i.e.*, sufficient to ensure that in this stage the scapula falls well in. This method possesses several advantages. Even at the first stage, thanks to the loosening of the lung and the insertion of the temporary plug, a compression is secured of the whole of the diseased area. The plug gives a powerful support to the front wall of the chest as well as to the mediastinum, this latter fact being of great value at the second stage. In the uncomplicated cases only a small number of ribs need be resected and the operation could possibly be performed in one stage, and for such cases this has become the operation of choice with us. In all the other cases, and especially the severe ones of upper lobe tuberculosis with extension to the opposite lung or with other complications, we have come more and more to prefer the form of thoracoplasty launched by Walter Schmidt. Both the operations are considerably lighter for the surgeon as well as for the patient. Since we have learned to master the technic fully, no serious complications have followed these operations. At first, probably acting under the influence of the general desire to secure an extensive apicolysis, I made excessive loosenings from the front wall of the chest and then had severe infections in the resulting cavity in one or two cases, possibly from cavity lesions. This has never sub-

sequently occurred. I have been able in every way to confirm Walter Schmidt's view that in this form plombage does not occasion any insurmountable difficulties. Moreover, the plug can be taken out without difficulty at the least sign of infection of the wound-cavity or other complications. However, it ought never to be removed until after from ten to fifteen days, when it will have had time to perform its most important duty of giving adequate stability to the plug-bed. The wound usually healed by first intention, but even in those cases in which it healed by second intention this caused no troubles. One often gets a strong impression of the correctness of Walter Schmidt's statement to the effect that the plug is, as it were, fed forward at the right moment. Frequently the plug remains in position, and is then also allowed to do so until signs are noticed of a forward bulge of the front thoracic wall or other symptoms which make it evident that the plug is seeking a way out of its bed. In such cases its extraction is always very simple. It can be effected under local anesthesia or under light etherization. The whole plug is taken out, the cavity is washed as carefully as possible with some antiseptic, as rivanol or chloramine, and the wound is immediately closed. I have never seen any serious complications after this operation, even though the mouth of a fistula may occasionally remain open for a short time.

This method has undoubtedly enabled us to attain considerably better results in every respect than previously. We have not, practically speaking, to expect any primary operative mortality. In the first operation from the front we consider we have a test operation which, if we carefully study the post-operative course, gives us a fairly clear picture of the patient's vital powers to react to surgical operations in general as well as of the general healing tendency of the tuberculous process. We can make this operation as mild as we wish in each special case. We can limit it to the resection of a single rib, in such cases usually the second. In certain doubtful cases we can omit the temporary plombage, but this procedure has come increasingly less in question as our technic has improved. The first operation, which is at the same time a first stage and an important test operation, need never cause any really severe general effect. In cases of emergency it can be performed under narcosis, preferably induced with evipan sodium or tribromoethanol (avertin) with amylene hydrate, it being necessary to spare the patient shocks as far as possible.

Just as experience from other fields shows that the patient bears surgical operations considerably better when they are performed in several stages, so may we also expect here some form of increased resistance to the following and more extensive operations. One can perhaps speak of an acquired power to resist operations better. This manifests itself more especially in reduced general effect and reduced risk of infection, and is most evident if the second stage is performed within a time limit not too distant from the first. A clear indication of the most suitable time for the second stage can be obtained by setting up a curve of the course of the sedimentation rate.

A complication we have never had to deal with here is mediastinal flutter, as the inserted plug with its capsule, or the bed formed around it in those cases in which the plug has been taken out, contribute to the support of a possibly yielding mediastinum. Nor have we, thanks to these circumstances, ever experienced the unpleasantness of seeing

a soft and yelding chest wall that oscillates backward and forward at every respiratory movement, sometimes bulging out like a hernia during coughing or straining.

Not without its value is undoubtedly the increased possibility plombage affords of securing a positive collapse of the parenchyma and stroma of the lung in the upper opening of the thorax. By this means, at least a partial solution has been gained of the problems posed by Perman in his anatomic investigations of the upper zone of the thorax. It is too early to make any precise statement of the permanent result, but we have a distinct impression that the percentage of definitively healed cavities is decidedly higher than in other forms of thoracoplasty employed by us. Not least of all in the prognostically unfavorable cases of "giant cavity" do we consider that, after many failures, we have found in this method a progressive surgical procedure that gives us good and lasting results even in grave and apparently quite hopeless cases. In some of these cases it is doubtless also necessary to attempt a loosening of the lung of the type practiced by Semb. We have tried to effect this by removing the plug on the ventral side before the second operation, sometimes doing this in the same stage, first taking out the plug and then doing a posterior thoracoplasty. No doubt the removal of the transverse processes recommended by Perman may also be of value for the avoidance of remnant cavity, and ought to be tried in suitable cases. As a standard method it is, in my opinion, unnecessary on the same grounds as applied to the apicolysis. The size and position of the cavity ought to be decisive in the individual case. Resection of the angulus scapulæ has also been tried by us in suitable cases, but we have not found it in any way advisable except on quite special indications.

One weighty reason for our going over more and more to Schmidt's method for all cases in which the outlook can be denoted as in the slightest measure dubious is that a long, bitter, and dearly purchased experience has brought us to realize our inability to prejudge with any certainty the powers of resistance to a surgical operation possessed by the different patients. Still less have we been able to predict with any certainty a given individual's vital powers of reaction, least of all in respect of the healing tendency of the tuberculous process. Here, we still have to depend largely upon our ability to judge each case by intuition. No one who has worked on these problems for any considerable time can fail to acknowledge how often we are mistaken.

It has often been our lot in Landskrona to receive two patients at a time. How often have we not tried to weigh the possibilities of the two individuals against each other, and how often have we not been compelled afterward to admit that we have been completely mistaken. The case from which we had expected least, perhaps nothing at all, has had a successful issue, and the case on which we had gone to work with enthusiasm has turned out a failure that has discouraged us for a considerable time. Faced with these facts, we cannot possibly fail to acknowledge the advantage of a method that enables us to proceed with our surgical treatment as cautiously as possible and with the least possible risk of immediate mortality, especially as the method would seem to offer equally good chances of attaining a definitively good result.

As a further safeguard against those failures which must inevitably occur when one widens one's field of indica-

tions beyond the usual limits, we have considered it expedient to divide our material, for the purpose of facilitating our determination of the indications for operation, into *four different groups* on a purely *a priori* basis of all we know of the patient, his previous history, and his present status. In this way it is easier at a post-operative examination to form a view of the immediate results. We have now set up a primary division into four groups of all the patients sent to us for operation from the sanatoria.

To Group I we refer all the cases coming in under the usual indications for collapse therapy. That is to say, all cases having unilateral, or practically speaking unilateral, cavernous phthisis with a distinct tendency to contraction of the lung. The cavity must not be overlarge, as this alone implies a considerably inferior prognosis for the case. Whether the limit can be set at the size of a pigeon's egg or a hen's egg, I will leave open, and this will always depend on the individual surgeon's temperament and experience. The patient must be in good general condition and not exhibit any complications from other organs, not be too young, too old, or too fat, and so on. A complicating tuberculosis of the larynx need not straightaway disqualify a patient from inclusion in Group I, even though it must be a premonitory sign to place him on the border to Group II. A complicating intestinal or renal tuberculosis, on the other hand, inevitably places the case outside the first group. In other words, in Group I are classed all patients for whom both *the phthisiologist and the surgeon consider they can positively advise an operation, and even consider they are justified in using a certain amount of personal persuasion to convince the patient that surgical measures ought to be taken.* This definition expresses perhaps more than anything else what we mean by Group I.

To Group II are referred those patients who have some complication in the form of bilateral tuberculous changes of the lungs, or changes in other organs, inferior general condition, albuminuria, adiposis, suspected cardiac changes, advanced age, etc., but for whom both lung specialist and surgeon, or perhaps only one of them, consider for some reason or other that operation can nevertheless be advised. In other words, the group is defined by the fact that *the positive initiative to the operation still comes from the physician or surgeon, or at least one of them, even if with a certain amount of doubt.* The patient ought then to be informed of this doubt.

To Group III are assigned all the cases in which these complications are present in such a high degree that neither of the professional advisers has been inclined to advise surgical operation. Of course, the matter may nevertheless have been discussed with the patient, and not so very infrequently it is the patient himself who has brought up the question of an operation, an increasingly common occurrence in our experience and one that will perhaps grow still more common. Hence in Group III are classed those cases in which *the responsible medical attendants consider after mature reflection that the patient should be given a chance, even though they are not positively disposed to advise the operation in question.*

Group IV should really not come in question in this discussion, for it comprises all those cases in which both the lung specialist and the surgeon are convinced that surgical operation is hopeless. Its inclusion here is chiefly due

to the fact that among the cases sent in by the lung specialists there have been a number which careful examination and reconsideration have shown to be absolutely unsuitable for operation. That, in spite of this, some of these patients have been operated upon is solely due to the fact that purely social or humane considerations have prevailed. We were not able to resist the insistent wish of the patient and his relatives that an operation should in any case be tried, and it is obvious that when we have given way to the temptation to operate in such cases it has been a great relief to know that in our method we possess a means that in certain cases is only a compromise. We have satisfied the patient's wish that an attempt should be made. We have made this attempt as gentle as possible. In a case here and there we have failed; in others we have obtained such clear contra-indications after the first operation that we could not continue, and the patient has contented himself with that. This procedure has enabled us to meet the wishes of the patient and at the same time to escape that depressing effect which a primary failure always has, not least of all purely psychologically, on the other patients. But the most important thing of all: we have also been able to learn that in a number of these cases our fears have been insufficiently founded and our serious conception of the case exaggerated. As a result we have been able to restore to life and health not a few persons for whom under other conditions we should *à priori* have had to abandon all idea of any surgical operation.

Much might be said, of course, concerning the grounds of selection for this grouping of patients. It is undoubtedly subjective and uncertain, just as everything must be in these questions so long as we are not standing on firmer ground than we are at present. I believe, however, that the essential grounds of division will be readily followed and grasped by those engaged in these problems, even though the group-limits will naturally be drawn differently by different surgeons. During the past year we have had the pleasure of finding an understanding for this classification also on the part of the phthisiologists. The patients are now sent to us furnished with a group number, by means of which we are better able to gauge what the lung specialist thinks of the case.

Our method of working as outlined above follows two main lines: (1) the primary division of the cases into special groups on the basis of the indications and prognosis as regards operative surgery, and (2) the special technic adopted from Schmidt and carried further by dividing the operation into two or more stages, the first of which, performed as a test operation, is a minor anterior thoracoplasty with plombage. This procedure, we consider, has carried us a good bit along the road to the goal we have always had before us: to try to help as many as possible of those sufferers from pulmonary disease who cannot be cured in any other way. I frankly admit that these are emergency and circuitous measures, but so long as no surer method is at our disposal, we should accept them with gratitude and be glad to find that, broadly speaking, the result has been satisfactory. I am quite convinced that increased facilities for judging the different cases on a purely scientific basis will carry us still further. To this end, however, a change is desirable in that attitude of indifference and rejection hitherto displayed by so many phthisiologists and surgeons toward all attempts to take up for trial the lines of investigation recommended by Gaupotz and others. It appears to

me to be already clearly established by the works published from Rohrbach that the result of such investigations offers an extremely good guide for surgical procedure.

RESULTS OF THE SURGICAL TREATMENT

In judging the operative results from a statistical point of view it is of great importance to take into consideration the character of the patient-material. Materials from different centers must frequently vary so widely that they cannot be statistically compared. Here, it seems to me, that the operative technic does not mean by far so much as the correct selection of cases. A higher or lower primary operative mortality may depend, of course, upon whether the operation has been performed in one or more stages, experience clearly showing that the one-stage procedure has a higher immediate mortality. Broadly viewed, however, especially when account is taken of the total mortality, it may doubtless be said that it is the character of the material rather than the operative technic which is of the greatest importance and which turns the scale. During the years I have had an opportunity of occupying myself with these operations, I have received the definite impression that the material was the worst possible.

In full agreement with the results published from the Malmö General Hospital, for the years 1913-1929, are those from my own cases of similar material during the first years, when, after working solely with plombage for some years, I went over to plastic operations. The cases are not many, only some 20 during five to six years, *i.e.*, four or five yearly. The technic followed was Sauerbruch's paravertebral, total or subtotal, in most cases performed in one stage. The primary operative mortality must be said to have been highly unsatisfactory, with 47 per cent primary and 58 per cent total mortality, which agrees with the Malmö figures calculated on the same basis, 43 and 68 per cent respectively. The percentage of definitive cures also agrees with that of the Malmö material. Against my 35 per cent healed with 23 per cent capable of working, stands Malmö's 32 per cent "healthy" patients.

Since I believe that I can definitely state that in the Malmö material it was not the surgical technic which caused this great loss of life, I believe I may also venture to assert the same regarding my own cases. The chief impression received from the investigation of these cases, however, is the same as that set forth above, and it is obvious that these bad experiences acted as a spur to fresh efforts to attain better results by other means. The first attempt in this direction was the adoption of Semb's improved technic and the strict performance of the operation in stages. Other dangers were encountered here, however, especially the increased risk of infection associated with the more or less thoroughly performed apicolysis. This applies in particular to the ticklish and dubious cases in which recourse to operation is only had with hesitation. The result of Semb's operation, however, proved to be considerably better than that of the operation of Sauerbruch. The number is of the same order, 23, during about the same period of time. The operative mortality is here considerably lower, or 17 per cent. The total mortality is 30 per cent, tb.-negative, up to 56.5 per cent, and capacity for work, likewise, 52.1 per cent.

In some earlier cases in which we could confidently content ourselves with a less extensive operation involving at most five ribs, we kept, as previously mentioned, to Semb's technic, more or

less modified according to the special nature of the case. Otherwise, in view of more especially the incalculable risks of infection, we have gone over more and more to the previously described method launched by Walter Schmidt. Our material of such cases is at present as large as that of the other two groups together, or some 40 cases. The result is satisfactory insofar as the mortality has dropped still lower, the primary operative mortality amounting to 7.1 per cent and the total mortality to 17.9 per cent. On the other hand, the tb.-negative cases have not yet come up to more than 66 per cent, which can definitely be attributed to the fact that all the cases are too recent in time to be judged with certainty. This applies in a still higher measure to the question of the capacity for work of the patients, as they are at present receiving pension certificates for the first two to three years after the operation, a measure that may be debatable but is unavoidable under present conditions, since there are no other possibilities of getting them back to work.

A division of these patients into the groups I have already outlined brings out the good results still more clearly. Within Group I we have no primary deaths either in the material treated according to Semb's method or that treated according to Schmidt's. A group of this small size does not permit of any percentage computation, but the value and importance of a pre-grouping of the patients in this way are quite evident from a glance at the tables set forth (Tables 3-5). This progressive improvement in our results can scarcely be interpreted otherwise than as an indication that we are on the right path, and should I have opportunities in the future of working with these operations I can only conceive the possibility of widening the field of indications for Walter Schmidt's technic.

Intentionally we have not examined the results of our extrapleural pneumolysis by Schmidt's technic, as we think that too short a time has passed since we began to test this method, to warrant us in giving an opinion about it.

SUMMARY

The author recommends thoracoplasty in stages combined with temporary "plombage," as described by Walter Schmidt, as the method of choice. The first stage consists of a minor anterior thoracoplasty with plombage, serving at the same time as a test operation for the patient's general resistance. The second stage consists of a dorsal resection of from six to eight ribs. In the author's experience this method gives on the whole the best results. As a safeguard against failures the author divides all the patients referred into four groups: Group I embraces those cases in which both phthisiologist and surgeon advise surgery strongly, grading down to Group 4, where surgery is inadvisable both from the surgical and medical points of view. The author gives his results in 56 cases operated on during the period 1932-1941, as compared to other methods. Total mortality: 17.9 per cent—this is definitely better than in Sauerbruch's or Semb's operation. TB.-negative cases: 66 per cent (only slightly better than with other procedures but too recent to yield definite results).

BIBLIOGRAPHY

1. Nissen, R.: Ueber die neuere Entwicklung der chirurgischen Behandlung der Lungentuberkulose, 1932.
2. Nissen, R.: Die chirurgische Behandlung der Oberlappenkavernen, Med. Klin., 1933, p. 23.
3. Sauerbruch, F., and Fick, W.: Die Beeinflussung der Lungentuberkulose durch operative Brustkorbeinengung und Plombierung, Ergebn. d. ges. Tuberk.-Forsch., VI, 1934.
4. Schmidt, Walter: Methoden zur Indikationsstellung der gezielten Plastik unter besonderer Berücksichtigung der Körperschichtaufnahme, Beitr. z. Klin. d. Tuberk., IV, 1936.

5. Schmidt, Walter: Gezielte Teilplastik, Pneumolyse, extrapleuraler Pneumothorax und Oleothorax als Methoden einer erhaltenden und schonenden operativen Kollapstherapie, Beitr. z. Klin. d. Tuberk., VIII, 1936.
6. Adelberger, Ludwig: Ueber Technik und Nachbehandlung der gezielten Teilplastik und der Pneumolyse, Beitr. z. Klin. d. Tuberk., VIII, 1936.
7. Gaubatz, Erwin: Ueber Funktionsprüfungen vor und nach operativer Kollapstherapie, Beitr. z. Klin. d. Tuberk., VIII, 1936.
8. Nissen, R.: Die chirurgische Behandlung der Oberlappencavernen, Schweiz. med. Wochenschr., March, 1937.
9. Gaubatz, Erwin: Ueber Funktionsprüfungen vor und nach operativer Kollapstherapie, Beitz. z. Klin. d. Tuberk., II, 1938.
10. Schmidt, Walter: Die Pneumolyse mit nachfolgendem extrapleuralen Pneumothorax oder Oleothorax, Beitr. z. Klin. d. Tuberk., II, 1938.
11. Perman, Einar: Nagra anatomiska synpunkter pa den fysikalisha lungdiagnostiken, Medicinska Föreningens Tidskrift, I, 1939.
12. Hein-Kremer-Schmidt: Die Kollapstherpie der Lungentuberkulose, Lehrbuch, 1939.
13. Adelberger, Ludwig: Technik und Instrumentarium zur gezielten Teilplastik und extrapleuralen Pneumolyse, Deutsches Tuberk. Bl., V, 1939.
14. Adelberger, Ludwig: Die Pneumolyse mit nachfolgendem extrapleuralem Pneumothorax oder Oleothorax, Beitr. z. Klin. d. Tuberk., V, 1939.
15. Gaubatz, Erwin: Beiträge zur klinischen Elektrokardiographie bei Lungentuberkulose, Beitr. z. Klin. d. Tuberk., 6 and 7, 1940.

SUMARIO

El Autor recomienda la Toracoplastia en periodos combinados con "plombage," como es descrito por Walter Schmidt, como metodo de seleccion. La primera intervencion consiste en una pequeña Toracoplastia anterior con "plombage," que sirve al mismo tiempo como ensayo operatorio de la resistencia general del enfermo. La segunda operacion consiste de una reseccion dorsal de seis á ocho costillas. En la experiencia del autor este metodo ó procedimiento dá, por todo, los mejores resultados.

Para evitar falta de éxito y como salvaguardia, el autor divide los pacientes que le son referidos en consulta, en cuatro grupos. El primer grupo comprende los casos en los cuales el Tisiologista y el Cirujano aconsejan tratamiento quirurgico forzosamente, graduando hacia abajo, hasta el grupo quarto, en los cuales la cirugia es desventajosa, del punto de vista quirurgico y médico.

El autor da sus resultados en 56 casos operados durante el preiodo 1932–1941, en comparacion con otros métodos. La mortalidad total 17.9 por ciento, que es definitivamente mejor que se obtiene con el Sauerbruch, ó el Sembe procedimiento. T.B. casos con 66%, solo es pequeña ventaja sobre otros procedimientos, y aun muy reciente para ofrecer resultados decisivos.

RÉSUMÉ

L'auteur recommande la thoracoplastie en étapes avec "plombage" temporaire ainsi que le décrit Walter Schmidt. Le premier temps consiste en une thoracoplastie mineure avec plombage et sert en même temps à déterminer la résistance du malade. Le second temps entraîne une résection dorsale de six à huit côté. D'après l'auteur, cette méthode dans son ensemble donne les meilleurs résultats. L'auteur classifie tous les cas en quatre groupes. Le premier groupe comprend tous les cas où la nécessité de l'opération est demandée par le physiologiste et par le chirurgien. Le quatrième groupe renferme les cas où l'opinion diffère sur l'urgence de l'opération. L'auteur rapporte 56 cas d'opérations durant la période de 1932 à 1941, avec une mortalité totale de 17.9 pour cent. Cela compare très favorablement avec les opérations de Sauerbruch et de Semb. Dans les cas tuberculeux 66 pour cent des résultats ne sont pas beaucoup supérieurs à ceux obtenus par les autres méthodes.

Solid Tumors of the Ovary

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THE ovary is unique in its capacity to develop tumors. No other organ gives rise to a greater variety of neoplasms than the ovary. These tumors are not limited to any age group, and may occur in infants, adolescent girls, children, mature women, and the aged. They may contain any human tissue, from clear fluid to hair, teeth or skin. Some of these tumors are frequently benign, and others are viciously malignant. These tumors are also unique in their symptomatic effect. Some attain enormous size with no associated symptoms, so that the patient thinks merely that she is getting fat. One group of ovarian tumors cause sexual precocity, intensify female traits, hasten development of sexual maturity in the young child and rejuvenate old women. In contradistinction, there is a group of ovarian tumors which cause a reversal of sexual traits, namely, masculinize and defeminize women, cause atrophy of the breasts and reproductive organs, stop menstruation, change facial appearances and cause deepening of the voice and a masculine distribution of hair. Eighty per cent of ovarian tumors are cystic, and 20 per cent are solid. Sixty-five per cent of the solid tumors are malignant.

In this paper I shall summarize information concerning the solid tumors of the ovary. These include:

(1) Brenner tumor
(2) Granulosa cell tumor
(3) Theca tumor
(4) Arrhenoblastoma
(5) Dysgerminoma
(6) Krukenberg tumor
(7) Teratoma
(8) Fibroma
(9) Sarcoma
(10) Adenocarcinoma

BRENNER TUMOR

Three hypotheses have been advanced in an effort to explain the origin of the Brenner tumor. Meyer, who found in the serosa of fallopian tubes tiny nests of "Brenner cells," favored the hypothesis of mullerian metaplasia. Schiller postulated a dislocation of epithelium from the primary urogenital connection. The third hypothesis, namely, that the tumor arises through a one-sided development in a teratoma, is based on its frequent association with pseudomucinous cystadenomas.

In 1908 Brenner described three solid ovarian neoplasms occurring in elderly women. Grossly, his specimens resembled fibromas, but microscopically he found scattered islands of cells resembling squamous epithelial cells in a dense stroma of connective tissue. He called the tumor "oophoroma folliculare," but it has since come to be known by the name of this early investigator.

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Following this original contribution, isolated reports of cases were added. In 1931 Robert Meyer was able to bring to 23 the number of reported examples, a number which had grown to 45 when Bland and Goldstein reported their case in 1935. The literature now contains approximately 70 examples of this newcomer in gynecology.

The Brenner tumor is almost always unilateral. Grossly, it resembles a fibroma, being whitish, and the solid variety is dense and hard. Another type of this tumor appears as a solid nodule arising in the wall of a cyst.

Microscopically, the picture is uniform and consists of islands of squamous-like epithelial cells in a dense stroma of fibrous tissue. The peripheral rows of these cells are frequently arranged in palisades. Some of the islands are cystic with an inner lining of columnar mucus-producing cells. Mitotic figures are not observed.

The clinical features of a Brenner tumor are those of a slowly growing pelvic neoplasm with none of the usual clinical features of a malignant tumor. Seventy per cent of the neoplasms occur after the menopause. These tumors have no hormonal influence.

The tumor is to be distinguished from granulosa cell neoplasm and from metastatic squamous cell epithelioma. This distinction is simply made with the Galantha stain for mucus.

GRANULOSA CELL TUMOR

The concept of Robert Meyer, that this tumor arose from granulosa cell rests in the ovarian hilus, is no longer tenable in its original form. Recent experiments by Butterworth have shown that granulosa cell tumors can be produced in mature female mice by the use of roentgen rays. These tumors, histologically and functionally entirely analogous to the granulosa cell tumors of women, appear to spring directly from degenerating follicular epithelium.

Although the granulosa cell neoplasm of the ovary had been described as early as 1855, the tumor did not receive the attention it now commands until Robert Meyer's contribution in 1915. Since that time, however, Robinson, King, Novak, Te Linde, Schiller, Neumann and other investigators have made substantial additions to this gynecologic entity, more than 300 cases of which have been reported.

Clinically, 60 per cent of granulosa cell tumors occur after the menopause, 30 per cent occur between puberty and the climacterium, and 5 to 10 per cent occur before adolescence. In childhood, such a tumor gives rise to precocious menstruation with early sexual and somatic development. During the period of sexual maturity it produces either amenorrhea per se or amenorrhea followed by profuse and continued menses. After the menopause, a granulosa cell neoplasm gives rise to a periodic pseudomenstrual type of bleeding in 90 per cent of the cases.

The basis for these symptoms is to be found in the tremendous quantities of estrogen elaborated by these tumors in all age groups. The hormone can be demonstrated in the blood and urine of patients who have a granulosa cell neoplasm and in almost unbelievable amounts in extracts of tumor tissue. The presence of estrogenic substance of granulosa cell tumor has been proved by the injection of extracts of the tumor into castrated rodents, which then show the usual vaginal cornification. Its action on the uterus is the production of myohyperplasia, with a thick, boggy, proliferative type of endometrium often containing cysts.

Pathologically, 90 per cent of granu-

losa cell tumors are unilateral, 90 per cent are solid and 90 per cent are of a relatively low grade of malignancy. They vary in size from the pinhead nodules described by Te Linde to large masses weighing as much as 34 pounds (15.3 Kg.), as in a case described by Dockerty and MacCarty. They appear to be well encapsulated. The cut surface has the homogeneous, granular appearance of liver sausage. Microscopically, there are the cylindroid, folliculoid and diffuse types of cellular pattern, and they may be found mixed on the same slide.

THECA CELL TUMOR

There are three theories to explain the origin of the theca cell tumor: (1) This neoplasm is derived from the ovarian stroma and is regarded as a luteinized fibroma; (2) the tumor is a luteinized granulosa cell tumor; (3) the growth arises from theca cells and represents a separate entity. Experimental evidence tends to support the third view.

The clinical features usually associated with theca cell tumors resemble closely those found in association with granulosa cell tumors of the ovary. More than 80 per cent of the neoplasms occur after the menopause and produce vaginal bleeding, which may or may not be periodic. The tumors reported among patients of the younger age groups have usually been associated with amenorrhea or with menometrorrhagia. The clinical picture is usually not so uniform as it is in the presence of a granulosa cell tumor, and some theca cell tumors apparently produce no menstrual abnormalities. As with granulosa cell neoplasms, the symptoms are caused by the secretion of estrogen by the cells of the ovarian neoplasm, as demonstrated by assay of tumor tissue.

The theca cell tumors are of a low grade of malignancy.

Pathologically, there are certain gross and microscopic features peculiar to all neoplasms of this theca cell group. The tumors are fibrous, solid, usually encapsulated and of canary yellow color. On section, the "liver sausage" consistency of granulosa cell tumors is lacking and, except for the yellow color, a diagnosis of fibroma would seem justified on gross inspection. A thin "rind" of ovarian tissue can usually be shelled from the surface of the tumor in the form of a smooth "capsule".

Histologically, the features are the predominance of plump, fusiform cells with vacuolated cytoplasm and oval nuclei. An epithelioid appearance is sometimes assumed. Intracellular fibrils are often abundant. The tumor cells and the interstitial substance both tend to undergo extensive hyalinization. Stains for lipid reveal the presence of fatty droplets within the cytoplasm of the tumor cells and to a lesser extent in the intercellular substance.

ARRHENOBLASTOMA

The arrhenoblastoma is an ovarian solid tumor marked by masculinizing activity.

As to the origin of this tumor, there are two schools of thought. Meyer, Goodhall, Novak and others believe that the growth arises from embryonic rests in the ovarian hilus and that these rests differentiate along male lines. Others are of the opinion that the tumor represents a one-sided development of a teratoma.

In 1905, Pick, of Germany, first described a peculiar ovarian tumor composed of epithelial elements in tubular arrangement different from any structures found in a normal ovary but bearing a strong resemblance to adeno-

matous tissue found and described in connection with the gonads of male pseudohermaphrodites. This he called a testicular tubular adenoma. Since that time various investigators have reported similar examples. Notably, Meyer, in an extensive study, found 17 instances of ovarian tumor of similar nature associated frequently with a peculiar symptom complex consisting of sterility, amenorrhea, hirsutism with a male distribution of hair, atrophy of the breasts, changes in the voice, hypertrophy of the clitoris, and the presence of an ovarian tumor. To this he gave the name "arrhenoblastoma" (make like a male).

Clinically, the presence of a palpable pelvic tumor associated with the masculinizing syndrome must make one consider also basophilic pituitary adenoma, pinealoma and an adrenal cortical tumor.

Grossly, the appearance of arrhenoblastoma is characteristic. It is a solid, multicentric nodule which presents a smooth, grayish surface without adhesions and without invasion by tumor cells. Microscopically, the epithelial elements are arranged in one of three different patterns: (1) an alveolar or tubular pattern; (2) solid cords or anastomosing strands, the so-called intermediate group; (3) a sarcomatoid arrangement. Mitotic figures are infrequent, and this, together with the degree of differentiation, indicates a low grade of malignancy. Lipid globules within the cytoplasm of the cells are arranged in a fashion resembling that of the interstitial cells of the testes. These are said to produce the secondary sex characteristics through the elaboration of the male sex hormone.

The arrhenoblastoma is usually a malignant tumor. For such growths in young persons conservative treatment is indicated, as 80 per cent of the tumors are benign. For arrhenoblastomas in older women, a radical surgical extirpation should be done.

DYSGERMINOMA

Dysgerminomas account for less than 20 per cent of malignant ovarian tumors. The tendency of this tumor to occur in patients with sexual maldevelopment is its most striking clinical feature.

The existence of a type of solid ovarian neoplasm with histologic features of undoubted malignancy and the clinical history of a more benign lesion has long been recognized. That this neoplasm occurred in young persons, that it was frequently bilateral and that it was often associated with genital hypoplasia were early observations of prime importance. The close resemblance of the cellular structure of the growth to that of the fetal gonad before the stage of sexual differentiation was the observation of Robert Meyer, who proposed the name "dysgerminoma" for this neutral type of tumor. The literature on this interesting neoplasm consists of reports of approximately 200 examples described under a range of terminology from "seminoma ovarii" (Chevassau) to "embryonal carcinoma."

Ovarian dysgerminoma has its "male" counterpart in the seminoma testis but runs a much less malignant course than the latter. In addition, there are certain age differences, dysgerminoma occurring usually before the age of 20 years and seminoma after the age of 20. Among pseudohermaphrodites of both sexes, the tumor is of relatively high incidence. It produces no hormones and hence no characteristic menstrual or other secondary sexual disturbances. However, the syndrome in a young woman who presents a pelvic tumor, pseudohermaphroditism or poorly de-

veloped genitalia, should make one think of the possibility of dysgerminoma.

Some of the tumors of this type are excessively malignant and others possibly benign. Dr. Seegar was unable to determine the degree of clinical malignancy by the histologic picture of the number of mitoses. In view of this, clinical observations remain the most trustworthy, and the tumor is to be considered malignant until it is proved benign.

Dysgerminoma occurs bilaterally in about 35 per cent of cases. Grossly, the neoplasms are nearly all of peculiar brainlike consistency with broad zones of necrosis and hemorrhage. Microscopically, the stromal reaction with lymphocytes and foreign body giant cells is almost pathognomonic. The tumor cells themselves are large and round, with hyperchromatic nuclei, large nucleoli and many mitotic figures. A complete lack of differentiation is outstanding, and the grade of malignancy is always 4. This probably accounts for the observation of Schiller and others that the tumor is extremely radiosensitive.

KRUKENBURG TUMOR

Although the so-called Krukenberg tumor has been the subject of much study and controversy, no one has yet given a better description of this tumor than he. According to his description, grossly, the tumor was of moderate size; it was nodular, yet it possessed a smooth surface. Adhesions were usually absent, but ascites was often found. The tumor was usually bilateral and was solid. In most cases the general form of the normal ovary was maintained. The cut surface had a myxomatous appearance. Microscopically, Krukenberg described "signet ring" cells surrounded by a fibrous stroma. He recognized the picture as one of undoubted malignancy, and considered the lesion as primary in the ovaries. He classified it among the sarcomas, but also suggested the possibility of its origin from epithelial cells.

The Krukenberg tumor was first called a sarcoma. Krukenberg carcinoma may be secondary to a variety of tumors, and not all ovarian carcinomas that are secondary to the alimentary tract are Krukenberg tumors. Probably not more than 25 per cent of all such secondary growths are of the Krukenberg type.

Important contributions by other writers have shown it to be of epithelial origin, and all workers have agreed on the secondary nature of the lesion. However, there is no general agreement as to what constitutes a Krukenberg tumor, how metastasis occurs, whether it is possible to distinguish a primary ovarian carcinoma from a Krukenberg tumor, or how the lesion should be treated.

TERATOMA

Teratoma of the ovary is defined as a tumor comprised of tissue elements derived from all three germ layers. The cystic teratoma is not uncommon, but the solid teratoma is rare and malignant.

These tumors are apparently due to the separation of a part of the ovum in the blastomere stage. The younger the ovum is, the more likely the undifferentiation and capability of producing more than one tissue. The older the ovum is, the more specialized the cells are and the less capable of producing more than one tissue.

Pathologically, ovarian teratomas are highly malignant. Like ovarian adenocarcinomas, the solid types probably begin with cellular proliferation in previously cystic growths. Growth is rapid, as indicated by a short duration of symptoms, and metastasis is often ex-

tensive at the time of operation. Grossly, various tissues may be recognized characteristically. Almost every tissue in the body has been reported present. Thyroid tissue has been noted. This may be hyperplastic, giving evidence of clinical hyperthyroidism. Growths containing such tissue are called "strumal" tumors. Teeth have sometimes been present, and brain tissue has been found. There has been placental tissue giving a positive Ascheim-Zondek reaction. Sarcoma, adenocarcinoma, squamous cell epithelioma, fibrosarcoma and chrondroma have been variously reported.

FIBROMA

Connective tissue tumors, fibroma and sarcoma, constitute about 5 per cent of all ovarian neoplasms. They may occur at any age. Fibroma is usually found in mature women, and is rarely larger than the size of a cocoanut. The origin of fibroma is uncertain, according to Aschoff, the points of origin being: (1) from an inflammatory exudate on the surface of the ovary, (2) from a corpus albicans, (3) from a corpus luteum, (4) from the stroma of the ovary, (5) from the capsule of the ovary, (6) from connective tissue organization following hemorrhage and (7) from the walls of blood vessels.

Since fibroma must develop from connective tissue, and connective tissue can be found in any of the sites just listed, this tumor probably develops from one or any of these locations.

It may occur in three forms: the diffuse, in which the whole ovary is involved; the circumscribed nodule, in which a portion of the ovary is involved, or the pedunculated type, which is rare.

The symptoms are not definite, the most common being pain due to pressure from the tumor and ascites. There is an increased size of the abdomen if the tumor has become large; backache, urinary symptoms, constipation and menstrual disturbances may be present. As to the physical manifestations, the growth is a pelvic tumor, unilateral in 90 per cent of cases. Ascites associated with a massive growth is present in 10 per cent of cases. The presence of fluid in the chest has been demonstrated by Meigs, of Boston, who stated that 27 cases have been reported thus far in the literature. This presence of fluid in the chest as well as in the abdomen is important, because such patients do not necessarily have a malignant tumor that has metastasized to the chest. Meigs has suggested that in such cases chest taps be done and that after centrifuging of the fluid the cells should be examined for evidence of malignancy and if this is absent the possibility of fibroma of the ovary should be considered.

Grossly, the tumor may vary from the size of a pea to the size of a man's head; the diffuse type may be spherical, ovoid or of kidney shape; the consistency is firm. Torsion of the pedicle is a frequent complication, and adhesions may be present. Usually there is a firm capsule, and on section the tumors show white whirling areas of connective tissue bundles. Secondary changes, chiefly due to circulatory disturbances, occur in about one half of the cases—edema, hemorrhage with softening, cavity formation and areas of calcification are frequent.

The microscopic appearance is variable. One sees mostly bundles of connective tissue, wavy or straight. The chief cell is the spindle cell. The nuclei vary greatly in size and number. Mitoses are almost entirely wanting in the benign growths, and their presence suggests malignancy. Bundles of smooth muscle fibers are often found.

The treatment is excision. The prognosis is excellent. Malignancy in fibrosarcoma is rare and of a low grade.

SARCOMA

Sarcoma is mesenchymal in origin, but the parent tissue is a matter of conjecture, the possibilities being (1) a preexisting fibroma, (2) the stroma of the ovary, (3) the walls of the blood vessels and (4) one-sided development in a teratoma.

The diagnosis of sarcoma of the ovary is more difficult than that of fibroma, because the tumor is softer and may be confused with other ovarian malignant tumors. It is distinguished from carcinoma by the difference in age, as carcinoma usually involves older women. Particularly if one finds a solid tumor with free fluid and evidence of malignancy, loss of weight, anemia and metastasis, one should think of sarcoma.

Pathologically, the appearance of sarcoma varies. It may be redddish or brownish, and much more vascular than fibroma. Secondary flat growths in the pelvis or throughout the peritoneal cavity, in the intestines and in the omentum, together with bloody fluid, may be present.

Histologically, the tumor presents a highly anaplastic growth. Sarcoma is among the most malignant of ovarian tumors. Metastasis and direct extension are the common modes of extension. Cures are rare. The treatment consists of early removal and postoperative irradiation.

ADENOCARCINOMA

Adenocarcinoma is one of the most common forms of solid tumor of the ovary. Like epidermoid carcinoma, it may present different degrees of differentiation, namely, a marked resemblance to endometrial carcinoma. Some adenocarcinomas are of a papillary pattern and some nonpapillary. Medullary carcinoma, carcinoma simplex, scirrhous carcinoma, alveolar carcinoma, and plexiform carcinoma are all varieties of the different tissue patterns occurring in the solid carcinomas of the ovary.

The size of the solid ovarian carcinoma is variable. Usually it gives rise to symptoms which call for treatment before the growth has reached more than a moderate size. As a rule the external surface is smooth, but it may present nodular or bosslike thickening. When one cuts into the tumor the surface may be seen to be gray with a brainlike consistency, and not infrequently there are irregular cavities caused by extensive necrosis. In a few growths of the scirrhous types, the consistency may be firm and fibrous. As the disease advances there is an increased tendency to involve both ovaries.

The clinical manifestations of adenocarcinoma are unfortunately late, as the onset of the disease is insidious. The presence of a mass in the lower part of the abdomen is usually first felt by the patient herself. Moderate heaviness or occasional pain may be noted, but it is usually absent. The same situation exists as to menstrual disorders. In postmenopausal cases slight bleeding may be noticed. Ascites is a relative accompaniment of ovarian malignant growths. The later course is characterized by weakness, loss of weight, recurring ascites, anemia and gastrointestinal disturbances.

Treatment is surgical, with postoperative employment of deep roentgen ray therapy.

BIBLIOGRAPHY

1. Meigs, J. V.: Endometrial Hematomas of the Ovary, Boston M. & S. J. **187**:1–13 (Dec.) 1922.
2 Hoon, M. R.: Fibromata of the Ovary, Surg., Gynec. & Obst. **36**:247 (Feb.) 1923.
3. Sampson, J. A.: Endometrial Carcinoma of the Ovary Arising in Endometrial Tissue in That Organ, Arch. Surg. **10**:1–72 (Jan.) 1925.

4. TeLinde, R. W.: Granulosal-Cell Tumors of Ovary and Their Relation to Postmenopausal Bleeding, Am. J. Obst. & Gynec. **20**:552 (Oct.) 1930.
5. Meyer, Robert: Pathology of Some Special Ovarian Tumors and Their Relation to Sex Characteristics, Am. J. Obst. & Gynec. **22**:697 (Nov.) 1931.
6. Meyer, Robert: Ueber gewebliche Anomalien und ihre Beziehung zu einigen Geschwulsten der Ovarien, Arch. f. Gynäk. **145**:2–69, 1931.
7. Bell, W. B.: Pathology and Clinical Features of Ovarian Neoplasms, J. Obst. & Gynaec. Brit. Emp. **38**:249, 1931.
8. Novak, E., and Long, H. J.: Ovarian Tumors Associated with Secondary Sex Changes, Granulosa Cell, Carcinoma and Arrhenoblastoma, J.A.M.A. **101**:1057 (Sept.) 1933.
9. Murphy, W. T.: Primary Malignant Tumors of the Ovary, Surg., Gynec. & Obst. **61**:289 (Sept.) 1935.
10. Novak, E., and Gray, L. A..: Clinical and Pathologic Differentiation of Certain Special Ovarian Tumors: Granulosa Cell, Carcinoma, Arrhenoblastoma, Disgerminoma, Brenner Tumor, Am. J. Obst. & Gynec. **31**:213 (Feb.) 1936.
11. Bland, P. B., and Goldstein, R: Granulosa Cell and Brenner Tumors of Ovary: Report of Case with Review of Those Cases Already Recorded, Surg., Gynec. & Obst. **61**:250 (Aug.) 1935.
12. Schiller, W.: Recent Findings in Solid Ovarian Tumours, J. Obst. & Gynaec. Brit. Emp. **43**:1135 (Dec.) 1936.
13. Meigs, J. V., and Cass, J. W.: Fibroma of the Ovary with Ascites and Hydrothorax: With a Report of Seven Cases, Am. J. Obst. & Gynec. **33**:249 (Feb.) 1937.
14. Meigs, J. V.: Fibroma of the Ovary with Ascites and Hydrothorax: A Further Report, Ann. Surg. **110**:731 (Oct.) 1939.
15. Dockerty, M. B., and MacCarty, W. C.: Granulosa Cell Tumors: With the Report of a 43 Pound Specimen and a Review, Am. J. Obst. & Gynec. **37**:425 (March) 1939.
16. Dockerty, M. B., and MacCarty, W. C.: Dysgerminoma, with a Report of Nine Cases, One Associated with Pregnancy, Am. J. Obst. & Gynec. **37**:878 (May) 1939.
17. Dockerty, M. B., and MacCarty, W. C.: Brenner Tumors of the Ovary: A Clinical and Pathologic Study of Ten New Cases with a Brief Review of the Literature, Am. J. Obst. & Gynec. **37**:703 (April) 1939.
18. Dockerty, M. B., and MacCarty, W. C.: Arrhenoblastoma, Surg., Gynec. & Obst. **68**:767 (April) 1939.
19. Pemberton, Frank A.: Carcinoma of the Ovary, Am. J. Obst. & Gynec. **40**:751 (Nov.) 1940.
20. Meigs, J. V.: Cancer of the Ovary, Surg., Obst. & Gynec. **71**:44 (July) 1940.
21. Novak, E.: Gynecological and Obstetrical Pathology with Chemical and Endocrine Relations, Philadelphia, W. B. Saunders Company, 1940.
22. Dockerty, M. B., and Counseller, V. S.: "Functioning" Tumors of the Ovary, editorial, Surg., Gynec. & Obst. **71**:245 (Aug.) 1940.
23. Dockerty, M. B., and MacCarty, W. C.: Solid Ovarian Tumors, Am. J. Path. **16**:641 (Sept.) 1940.
24. Dockerty, M. B.: Theca Cell Tumors of the Ovary: Report of Ten Cases, Am. J. Obst. & Gynec. **39**:434 (March) 1940.
25. Dockerty, M. B., and Masson, J. C.: Clinical Features, Types and Grades of Malignant Ovarian Tumors, Surg. Clin. North America **21**:1201 (Aug.) 1941.
26. Peale, A. R.: Bilateral Brenner Tumor of the Ovary, Am. J. Obst. & Gynec. **44**:138 (July) 1942.
27. Taylor, H. C., and Greeley, A. V.: Factors Influencing the End-Results in Carcinoma of the Ovary: Report of a Series of 138 Patients Treated from 1910 to 1935, Surg., Gynec. & Obst. **74**:928 (May) 1942.
28. Leffel, J. M.; Masson, J. C., and Dockerty, M. B.:. Krukenberg's Tumors: A Survey of Forty-Four Cases, Ann. Surg. **115**:102 (Jan.) 1942.
29. Dockerty, M. B.: Practical Considerations of Ovarian Tumors, editorial, Surg., Gynec. & Obst. **75**:391 (Sept.) 1942.
30. Lynch, F. W.: A Clinical Review of One Hundred and Ten Cases of Ovarian Carcinoma, Am. J. Obst. & Gynec. **32**:753 (Nov.) 1936.
31. Wharton, Lawrence R.: Gynecology, with a Section on Female Urology, Philadelphia, W. B. Saunders Company, 1943.
32. Novak, E.: Gynecology, second edition of Gynecology and Female Endocrinology, Baltimore, Williams & Wilkins Company, 1944.

RESUMEN

Los autores hacen, de un modo sistemático y conciso, una descripción clínica y anatomopatológica de cada uno de los tipos de tumores sólidos del ovario: (1) tumor de Brenner; (2) tumor de células granulosas; (3) tumor de células de la teca; (4) arrhenoblastoma; (5) disgerminoma; (6) tumor de Krukenberg; (7) teratoma; (8) fibroma; (9) sarcoma y (10) adenocarcinoma.

RÉSUMÉ

Les auteurs nous donnent une description concise et systématique, clinique et pathologique, des différents néoplasmes solides de l'ovaire: (1) Brenner tumeur; (2) tumeur à cellules granuleuses; (3) tumeur thécale; (4) arrhénoblastome; (5) dysgerminome; (6) tumeur de Krukenberg; (7) tératome; (8) fibrome; (9) sarcome, et (10) adénocarcinome.

СВОД

Авторы дают систематическое и точное описание каждого типа массивных опухолей яичника: 1. опухоль Бреннера; 2. гранулозно-клеточная опухоль; 3. опухоль оболочки; 4. аренобластома; 5. дисгерминома; 6. опухоль Крукенберга; 7. тератома; 8. фиброма; 9. саркома, и 10. адэнокарцинома.

The treatment is excision. The prognosis is excellent. Malignancy in fibrosarcoma is rare and of a low grade.

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BIBLIOGRAPHY

1. Meigs, J. V.: Endometrial Hematomas of the Ovary, Boston M. & S. J. **187**:1–13 (Dec.) 1922.
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4. TeLinde, R. W.: Granulosal-Cell Tumors of Ovary and Their Relation to Postmenopausal Bleeding, Am. J. Obst. & Gynec. **20**:552 (Oct.) 1930.
5. Meyer, Robert: Pathology of Some Special Ovarian Tumors and Their Relation to Sex Characteristics, Am. J. Obst. & Gynec. **22**:697 (Nov.) 1931.
6. Meyer, Robert: Ueber gewebliche Anomalien und ihre Beziehung zu einigen Geschwulsten der Ovarien, Arch. f. Gynäk. **145**:2–69, 1931.
7. Bell, W. B.: Pathology and Clinical Features of Ovarian Neoplasms, J. Obst. & Gynaec. Brit. Emp. **38**:249, 1931.
8. Novak, E., and Long, H. J.: Ovarian Tumors Associated with Secondary Sex Changes, Granulosa Cell, Carcinoma and Arrhenoblastoma, J.A.M.A. **101**:1057 (Sept.) 1933.
9. Murphy, W. T.: Primary Malignant Tumors of the Ovary, Surg., Gynec. & Obst. **61**:289 (Sept.) 1935.
10. Novak, E., and Gray, L. A..: Clinical and Pathologic Differentiation of Certain Special Ovarian Tumors: Granulosa Cell, Carcinoma, Arrhenoblastoma, Disgerminoma, Brenner Tumor, Am. J. Obst. & Gynec. **31**:213 (Feb.) 1936.
11. Bland, P. B., and Goldstein, R: Granulosa Cell and Brenner Tumors of Ovary: Report of Case with Review of Those Cases Already Recorded, Surg., Gynec. & Obst. **61**:250 (Aug.) 1935.
12. Schiller, W.: Recent Findings in Solid Ovarian Tumours, J. Obst. & Gynaec. Brit. Emp. **43**:1135 (Dec.) 1936.
13. Meigs, J. V., and Cass, J. W.: Fibroma of the Ovary with Ascites and Hydrothorax: With a Report of Seven Cases, Am. J. Obst. & Gynec. **33**:249 (Feb.) 1937.
14. Meigs, J. V.: Fibroma of the Ovary with Ascites and Hydrothorax: A Further Report, Ann. Surg. **110**:731 (Oct.) 1939.
15. Dockerty, M. B., and MacCarty, W. C.: Granulosa Cell Tumors: With the Report of a 43 Pound Specimen and a Review, Am. J. Obst. & Gynec. **37**:425 (March) 1939.
16. Dockerty, M. B., and MacCarty, W. C.: Dysgerminoma, with a Report of Nine Cases, One Associated with Pregnancy, Am. J. Obst. & Gynec. **37**:878 (May) 1939.
17. Dockerty, M. B., and MacCarty, W. C.: Brenner Tumors of the Ovary: A Clinical and Pathologic Study of Ten New Cases with a Brief Review of the Literature, Am. J. Obst. & Gynec. **37**:703 (April) 1939.
18. Dockerty, M. B., and MacCarty, W. C.: Arrhenoblastoma, Surg., Gynec. & Obst. **68**:767 (April) 1939.
19. Pemberton, Frank A.: Carcinoma of the Ovary, Am. J. Obst. & Gynec. **40**:751 (Nov.) 1940.
20. Meigs, J. V.: Cancer of the Ovary, Surg., Obst. & Gynec. **71**:44 (July) 1940.
21. Novak, E.: Gynecological and Obstetrical Pathology with Chemical and Endocrine Relations, Philadelphia, W. B. Saunders Company, 1940.
22. Dockerty, M. B., and Counseller, V. S.: "Functioning" Tumors of the Ovary, editorial, Surg., Gynec. & Obst. **71**:245 (Aug.) 1940.
23. Dockerty, M. B., and MacCarty, W. C.: Solid Ovarian Tumors, Am. J. Path. **16**:641 (Sept.) 1940.
24. Dockerty, M. B.: Theca Cell Tumors of the Ovary: Report of Ten Cases, Am. J. Obst. & Gynec. **39**:434 (March) 1940.
25. Dockerty, M. B., and Masson, J. C.: Clinical Features, Types and Grades of Malignant Ovarian Tumors, Surg. Clin. North America **21**:1201 (Aug.) 1941.
26. Peale, A. R.: Bilateral Brenner Tumor of the Ovary, Am. J. Obst. & Gynec. **44**:138 (July) 1942.
27. Taylor, H. C., and Greeley, A. V.: Factors Influencing the End-Results in Carcinoma of the Ovary: Report of a Series of 138 Patients Treated from 1910 to 1935, Surg., Gynec. & Obst. **74**:928 (May) 1942.
28. Leffel, J. M.; Masson, J. C., and Dockerty, M. B.:. Krukenberg's Tumors: A Survey of Forty-Four Cases, Ann. Surg. **115**:102 (Jan.) 1942.
29. Dockerty, M. B.: Practical Considerations of Ovarian Tumors, editorial, Surg., Gynec. & Obst. **75**:391 (Sept.) 1942.
30. Lynch, F. W.: A Clinical Review of One Hundred and Ten Cases of Ovarian Carcinoma, Am. J. Obst. & Gynec. **32**:753 (Nov.) 1936.
31. Wharton, Lawrence R.: Gynecology, with a Section on Female Urology, Philadelphia, W. B. Saunders Company, 1943.
32. Novak, E.: Gynecology, second edition of Gynecology and Female Endocrinology, Baltimore, Williams & Wilkins Company, 1944.

RESUMEN

Los autores hacen, de un modo sistemático y conciso, una descripción clínica y anatomopatológica de cada uno de los tipos de tumores sólidos del ovario: (1) tumor de Brenner; (2) tumor de células granulosas; (3) tumor de células de la teca; (4) arrhenoblastoma; (5) disgerminoma; (6) tumor de Krukenberg; (7) teratoma; (8) fibroma; (9) sarcoma y (10) adenocarcinoma.

RÉSUMÉ

Les auteurs nous donnent une description concise et systématique, clinique et pathologique, des différents néoplasmes solides de l'ovaire: (1) Brenner tumeur; (2) tumeur à cellules granuleuses; (3) tumeur thécale; (4) arrhénoblastome; (5) dysgerminome; (6) tumeur de Krukenberg; (7) tératome; (8) fibrome; (9) sarcome, et (10) adénocarcinome.

СВОД

Авторы дают систематическое и точное описание каждого типа массивных опухолей яичника: 1. опухоль Бреннера; 2. гранулозно-клеточная опухоль; 3. опухоль оболочки; 4. аррenобластома; 5. дисгерминома; 6. опухоль Крукенберга; 7. тератома; 8. фиброма; 9. саркома, и 10. адэнокарцинома.

A New Operative Technic for Cysts of the Lung and for Chronic Spontaneous Pneumothorax*

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THE two conditions whose surgical treatment is the topic of this paper are linked together by a similar mechanical peculiarity. They both communicate with the bronchial tree.

There is no time to go into the etiology of the chronic spontaneous pneumothorax, which can be a very obstinate pathologic condition. Its most common cause is the rupture of localized emphysematous tissue, usually at the apex of the lung. This circumscribed emphysema is due to scar formation following a healed tuberculous lesion. The reason why the rupture in many cases does not heal by itself or has a tendency to recur can be seen in the presence of pleural adhesions which do not permit closure of the opening.

In the cases where localized adhesions were evidently the reason for the maintenance of the opening in the lung tissue, pleurolysis should be performed in order to assure complete collapse of the lung. If that is done by open intercostal approach, one easily succeeds in identifying the rupture by administering intratracheal pressure respiration.

Then the gap in the lung tissue can be closed in accordance with well-established surgical principles.

This sort of closure was employed in seven cases; in two of them no opening in the lung tissue could be demonstrated. Nevertheless, inversion of the whole suspected area was done.

There were no complications after these rather small interventions. The reëxpansion of the lung which had been in a state of collapse for from one and a half to six years took four to twelve weeks. None of the cases showed a recurrence in a follow-up from one-half to five years. In three cases fluid appeared postoperatively in the corresponding pleural space. This was resorbed in due time.

When a girl of 12 years was referred to us for surgical treatment of an enormous air cyst of the right lung, the experiences with treatment of spontaneous pneumothorax came to mind. The diagnosis was not absolutely clear; spontaneous pressure pneumothorax due to rupture of a lung cyst could not be ruled out. In view of the greatly reduced respiratory surface no attempt was made to ascertain the diagnosis by means of bronchography.

Likewise we abstained from aspiration of air, though the heart was markedly displaced, since we were afraid to produce a pneumothorax by tapping the cyst.

The treatment of larger air cysts of the lung, though strongly indicated, because of the danger of rupture or infection is, as Wood puts it, "unsatisfactory to say the least." Of course, there is the radical procedure of lobectomy or pneumonectomy which has been accepted by most surgeons as the only successful method. Though lobectomy and pneumonectomy are nowadays well-established

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operations with a comparatively low mortality, it is our feeling that the indications for these interventions have been overstepped. That is particularly true for pneumonectomy. Loss of respiratory surface after that operation, as well as shrinking of the corresponding thoracic wall and shifting of the heart, involves a certain degree of disability to which we should yield only under the impact of sheer necessity.

For benign lesions any successful conservative operation is preferable.

Enucleation of the cyst as a rule is not feasible, since air cysts do not possess a well defined wall.

There are many other procedures recommended and tried, all of them with unsatisfactory results.

It was thought that a procedure along the lines followed in the treatment of chronic spontaneous pneumothorax would be feasible.

OPERATIVE PROCEDURE

Under intratracheal cyclopropane anesthesia, the right thoracic cavity was entered through the fourth intercostal space between the posterior axillary and the midclavicular lines. After insertion of the rib retractor a rather impressive picture came into view. The presenting air cyst resembled a large ovarian cyst. In exploring the right hilus it became evident that the mediastinal folds were absent. There was a broad communication between the right and left thoracic cavity, a part of the cyst occupying the dome of the left thoracic space. The cyst was tapped and the air removed; thus a temporary collapse was obtained. It was only now that normal lung tissue in the apex and in the lower lobe could be exposed. Within two minutes the cyst filled again, the air being under considerable pressure. The procedure now used consisted of the following steps:

At first a cruciate incision of the cortical cover of the cyst was performed, the longitudinal incision being 30 cm. in length.

The inner surface of the cyst revealed a trabecular structure due to large vessels radiating from the hilus. No signs of epithelial cover were evident. By applying considerable intratracheal pressure, one large opening and a smaller opening could be identified, both openings communicating with the trachea, the main bronchus apparently being absent. Two small bronchi, one leading to the normal remainder of the upper lobe and the other leading to the remainder of the lower lobe, could be demonstrated.

The next step consisted of closure of the communication between cyst and trachea by purse-string sutures. Care had to be taken not to perforate one of the large vessels. Adequacy of the closure was tested by intratracheal pressure administered by the anesthetist.

The third step consisted of a plication of the inner wall of the sac by several infolding sutures. These are placed between the branches of the vessels and parallel to them.

The next step was a tight inversion of the contracted wall so that plugging of the purse-string sutures could be obtained.

In the last step the tissue plug was buried under normal lung tissue by seroserous sutures uniting normal lung tissue of upper and lower lobe.

At completion of the procedure the remainder of the right lung did not fill more than one-third of the right thoracic space, because the atelectasis of the normal lung tissue could not be overcome by forcible inflation.

The incision of the chest wall was closed in four layers.

Postoperative treatment was the same as after lobectomy. The oxygen tent was

dispensed with on the second postoperative day.

Recovery was uneventful.

The first x-ray picture, taken on the tenth postoperative day, revealed a fair-sized pneumothorax, the heart being in normal position. A dense round shadow, corresponding to the plicated sac of the cyst, was visible.

Three months after operation the right thoracic cavity was filled by normal lung tissue, the round shadow close to the hilus having the same size and density as in the last picture. The dome of the left thoracic cavity formerly occupied by the left side extension of the cyst showed normal lung structure.

Follow-up for four months did not reveal any changes in the x-rays taken in a month's interval.

The general condition of the child has shown continuous improvement. To date she has gained 25 pounds.

CONCLUSION

There is reason to believe that the endorráphy, as described above, has proved to be a rational procedure in the surgical treatment of air cysts of the lung.

SUMMARY

Etiology of chronic spontaneous pneumothorax is discussed and a new operative technic for cysts of the lungs and for chronic spontaneous pneumothorax is presented. It consists of the following steps: (1) A cruciate incision of the cortical cover of the cyst was performed. (2) Communication between cyst and trachea was closed by purse-string sutures. (3) The inner wall of the sac was plicated by infolding sutures placed between and parallel to the branches of the vessels. (4) The contracted wall was tightly inverted to obtain plugging of the purse-string sutures. (5) The tissue plug was buried under normal lung tissues by sero-serous sutures uniting normal lung tissue of upper and lower lobe. Postoperative treatment did not differ from that of lobectomy.

SUMARIO

El autor discute la etiología del neumotorax espontáneo crónico y una nueva técnica operatoria para ciste-pulmonar y para neumotorax crónico espontáneo y consiste en los procedimientos siguientes: (1) Una incisión cruciforme de la cubierta cortical del ciste. (2) La communicación entre el ciste y la tráquea se cierra por una sutura a cordón de bolsa. (3) La pared interna del saco se dobla por medio de suturas que encierran el saco paralelamente a las ramificaciones vasculares. (4) La pared contraída se invierte firmemente para tamponear las suturas a cordón de saco. (5) El tapón de tejidos se cubre con parenquima pulmonar por suturas seroserosas, uniendo el tejido normal pulmonar del lóbulo superior e inferior. El tratamiento postoperatorio no varia del empleado en la lobectomía.

RÉSUMÉ

L'auteur discute l'étiologie du pneumothorax spontané et présente une nouvelle technique opératoire pour les kystes du poumon et pour les pneumothorax chronique: Voici les différents temps de l'opération: (1) incision cruciale de l'enveloppe du kyste; (2) fermeture de la communication entre le kyste et la trachée par une suture en bourse: (3) la paroi interne du sac est oblitéré par l'insertion de sutures placées parallèlement aux vaisseaux; (4) inversion complète de la paroi du sac afin d'obtenir un tamponnement complet de la suture en bourse; (5) le bouchon est enfoui dans du tissu pulmonaire normal par des sutures séro-séreuses unissant le tissu normal des lobes supérieur et inféieur. Le traitment postopératoire ne diffère pas de celui employé pour la lobectomie.

Sano Tissue Glue Skin Grafting

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THE standard procedure of Dr. M. E. Sano, of Philadelphia, Pa., was attempted, in which 1 mg. of heparin plus 1 cc. of Tyrode solution plus 5 cc. of the patient's blood were mixed and then centrifuged. The plasma preparation was then painted with a camel's hair brush on the recipient area. The cell extract plus 0.5 cc. of Tyrode solution was painted on the under surface of the graft. Both solutions were prepared under sterile conditions.

The Sano method of skin grafting was tried in the following cases:

CASE 1.—A captain in the tank corps received a shrapnel wound of the right ilium, which penetrated that bone and produced numerous perforations of the small intestine and colon. The shrapnel was lodged near the fifth lumbar vertebra. The entrance of the shrapnel left a large defect in the skin over the right ilium. A draining sinus resulted, which drained approximately three to four months, as the shrapnel was not removed. It was eventually removed about three to four weeks before my associates and I saw him, when he was transferred to our service. The cutaneous defect was about 3 inches (7.5 cm.) in depth, and movement of the vertebral column would produce a narrowing of the U-shaped opening. A thin or full skin graft would have been difficult; hence this was an ideal opportunity to try the Sano method of skin grafting. The coagulum was applied to the graft and the recipient area, and the U-shaped space was lightly packed with waste. In three days, the waste was removed and the graft was examined. No hemorrhages, blebs or moving of the graft had occurred. The result was perfect.

From the Department of Anatomy, University of Kansas City.

CASE 2.—A private was transferred to our service after he had been to the general surgery service for treatment of an abscess in the right axilla, which was drained and curetted. He was given penicillin prior to the operation, which gave him no relief from his infection. The abscess was apparently idiopathic. When he was seen by my associates and me, no infection was present, as the wound was granulating and the depression was filling in with granulation tissue. With no skin grafting, the wound would result in cicatrix with adduction of the right arm and limitation of motion of the arm. The Sano method was tried. An area of about 8 by 8 cm. was removed with the dermatome, and prepared by painting with the plasma mixture with a camel's hair brush. No sutures were utilized, and waste was used for some compression owing to an unusual contour of the recipient area of the axilla. In twenty-four hours the graft was examined for movement, but none was found. The arm was placed in abduction, and three days later the waste was removed and the graft was examined. Three small necrotic areas had appeared in the center of the skin. In a few days the necrotic areas were replaced with Thiersch grafts from the arm. The edges of the graft were in excellent condition. When last seen, the axillary defect was filling, more so since the skin grafting, and it appeared to be almost normal.

CASE 3.—A master sergeant in the communication service had received an extensive second degree burn of the back, due to a live wire of high tension. The cicatrix over the right scapula was removed and replaced by a thin skin graft by the Sano method. The usual procedure was applied with bismuth tribromphenate ("xeroform") gauze to the skin graft. In twenty-four hours, the graft was examined. It was discovered that the upper lateral border had moved, and it was

impossible to restore it to its original position, as it was too tightly adherent to its recipient area. Some necrosis had ensued, which made us somewhat disappointed. We believed that this man had moved about in bed too much on his back and had produced this movement. Any movement of his right arm would create a movement of the scapula and hence some movement of the graft.

CASE 4.—A staff sergeant received a gunshot wound through the right knee while in Africa. A right popliteal arteriovenous fistula developed, which was corrected in San Francisco. After this operation, he acquired an indolent ulcer of the right popliteal fossa, which failed to respond to any treatment. The cicatrix was excised and replaced by a thin skin graft by the Sano method. The graft was examined in twenty-four hours, and the edges of skin were in perfect apposition, with no blebs or hemorrhages under the skin. The knee joint was immobilized with a plaster cast. A perfect result occurred in this case.

CASE 5.—A private accidentally stepped on a land mine in Louisiana. He sustained a compound, comminuted fracture of the tibia and fibula, with a resulting indolent cicatrix over the anterior midshaft of the tibia. The cicatrix was excised and replaced with a thin skin graft by the Sano method. The graft was reinforced with bismuth tribromphenate gauze. It was examined in twenty-four hours, and the edges of skin were in correct apposition, tightly adherent. It had a purplish appearance. The result was ideal.

COMMENT

The bleeding of recipient areas was controlled entirely by hot saline compresses, no suture material being utilized, as we felt it was not conducive to good grafting. We had some bleeding only in case 3, and that could have been avoided if more precaution had been taken. Some movement of the graft had ensued because it was over a dependent bony prominence. The grafts were tightly adherent in twenty-four hours. The Sano method may be used to some advantage for grafting in unusual contours in which it would be difficult to use sutures or apply pressure, as in cases 1 and 2. The time element is a factor. The plasma and cell extract appeared to promote coagulation of bleeders in recipient areas and also to eradicate accumulation of excess serum under the graft. Five cases are not sufficient to pass critical judgment, but I should conclude, from what we have seen and done and the results obtained, that the Sano method should be favorable.

SUMMARY

Grafting by the Sano tissue glue method was attempted in 5 cases, and the results were favorable. This indicates that this method has some practical value. Hospitalization has been reduced to a minimum, and the time required for the operation itself has been shortened. The line of apposition between the recipient and donor tissues is not so conspicuous as with other methods.

REFERENCES

Sano, M. E.: Surg., Gynec. & Obst. 77:510–512 (Nov.) 1943. Am. J. Surg. 61:105–106, 1943.

RESUMEN

En 5 casos se han llevado a cabo injertos por el método de Sano (tejido engomado) obteniendose resultados satisfactorios, lo cual indica que el procedimiento referido está dotado de un cierto valor práctifo. Con el empleo de esta técnica se ha acortado el tiempo de hospitalización, y se ha reducido, por otro lado, el periodo de duración de la intervención quirurgica. Hay que resaltar que la línea de aposición entre los tejidos del dador y el recibidor no es tan marcada como con los otros métodos.

RÉSUMÉ

Le greffage d'après la méthode tissu glu de Sano fut pratiqué 5 fois avec succès par l'auteur. Cela indique que la méthode a une valeur pratique. Avec cette méthode le séjour à l'hôpital est abrégé et l'acte opératoire s'effectue en moins de temps. La ligne d'apposition de la greffe est moins visible que par l'emploi des autres méthodes.

Свод

Пересадка кожи по клеевой методе Sano была успешно произведена в пяти случаях. Это показывает, что этот способ имеет известную практическую ценность. При его употреблении пребывание в больнице было минимальным и было укорочено время, необходимое для производства самой операции. Линия аппозиции тканей донора и рецептора была менее заметна, чем при других способах.

RUSSIAN SUMMARY FOR ARTICLE BY SPAETH AND KREWSON

(IN AUGUST ISSUE)

СВОД

Очень трудно поставить диагноз чисто артериальной аневризмы круга Willis'a; диагноз более часто приходится сделать исключением, чем подтверждением, и обыкновенно он подтверждается разрывом. Артериовенозные аневризмы сосудов, или по близости сосудов, составляющих круг Willis'a не представляют очень сложные диагностические задачи. Их легко удалить хирургически. Хирургический подход, за исключением Dandy интракраниальной перевязки (соображение которой здесь не включено) состоит предпочтительно (и следуя хорошо известную обыкновенную предварительную диагностическую процедуру) из перевязки общей сонной артерии, а затем, если необходимо, из перевязки коллатеральных сосудов как язычная, лицевая, затылочная, височная и, особенно, позже, внутренняя сонная артерия. После перевязки общей сонной артерии, внутренняя сонная артерия в действительности делается, на основании анастомозов с соответствующими артериями противоположной стороны шеи и лица, ветвью наружной сонной артерии. Перевязка, позже, внутренней сонной артерии дает возможность развить коллатеральное кровообращение, центростремительно к черепной полости, до степени достаточной, чтобы вполне предохранить осложнения, появляющиеся в связи с первичной перевязкой.

Библиография содержит 363 справок от 1807 года до времени этой статьи.

Local Infiltration of Procaine Hydrochloride Solution Combined with Intravenous Administration of Pentothal Sodium

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FOR certain urgent operations, notably those for perforated peptic ulcer, acute pancreatitis and diffuse peritonitis from any cause, I have found that local infiltration combined with intravenous pentothal sodium * anesthesia is unexcelled. It is in emergencies such as these that, fearing chest complications, I strive to avoid use of an inhalation anesthetic.

Having become familiar with this form of combined anesthesia, I have little doubt that the surgeon, particularly the isolated surgeon, will find an increasing field for its application.

Although the procedure is absolutely simple and, if carried out in the manner I shall detail, is safe, experience has taught me that there are a surprising number of possible errors and misunderstandings, many of which may spell disaster. Among these mistakes are: injecting the pentothal solution into the rubber tubing near the interceptor as opposed to near the vein; injecting the pentothal solution and then turning on the saline solution (which was dripping slowly) to a faster rate; allowing the receptacle containing the saline solution to run dry when all eyes are focused on the operation or the patient's face; preparing two 1 Gm. doses of pentothal sodium (larger ampules) instead of two 0.5 Gm. doses.

Again I stress the need for adhering to the technic described in its entirety. Many modifications were tried before these ultrasimple steps of the procedure were stabilized. In my endeavor to avoid misinterpretation, I crave the indulgence of the reader for my reiteration of what at first sight may appear ridiculously elementary instructions.

In order to expound the technic, a case of perforated peptic ulcer will be chosen. The choice of case is deliberate, for in my opinion it is of cardinal importance to avoid an inhalation anesthetic in unselected examples of this catastrophe.

TECHNIC OF PREOPERATORY PREPARATION

In the Ward.—The stomach is emptied with a gastric aspiration tube, which is left in place. The patient is given a suitable dose of morphine, and his eyes are blindfolded securely. He is transported to the operating theatre.

In the Operating Theatre.—A cannula is tied into a vein, or the bone marrow of the manubrium is cannulized. The choice of the route by which fluid is introduced into the circulation is not stereotyped; indeed, there are three avenues for its reception, each having advantages and disadvantages.

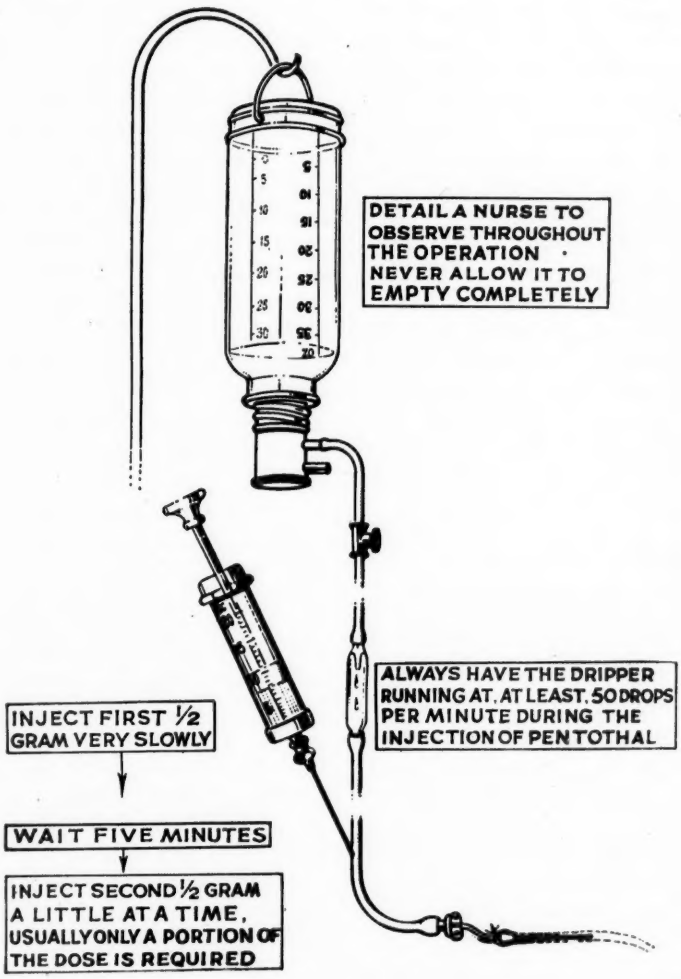
1. An internal saphenous vein has the advantage that the infusion paraphernalia are well away from the abdomen. The main disadvantage is that the anesthetist has

* Pentothal sodium is sodium ethyl (1-methylbutyl) thiobarbiturate.

to journey to and from the patient's head and foot.

2. A vein of the left forearm is open to the objection that the extended arm and the attached apparatus hamper the surgeon's assistant.
3. The bone marrow of the sternum is efficient provided all concerned are familiar with this route.

Haste Is Unnecessary.—Once the fluid is dripping into the circulation, unless the patient is moribund, his general condition commences to improve rather than to deteriorate. If necessary, he can receive a pint of plasma before the intravenous introduction of the saline solution; indeed, until the patient has an adequate blood pressure (at least


DETAIL A NURSE TO OBSERVE THROUGHOUT THE OPERATION · NEVER ALLOW IT TO EMPTY COMPLETELY
ALWAYS HAVE THE DRIPPER RUNNING AT, AT LEAST, 50 DROPS PER MINUTE DURING THE INJECTION OF PENTOTHAL
INJECT FIRST ½ GRAM VERY SLOWLY
WAIT FIVE MINUTES
INJECT SECOND ½ GRAM A LITTLE AT A TIME, USUALLY ONLY A PORTION OF THE DOSE IS REQUIRED

Symposium of essential details for supplementing local infiltration with intravenous anesthesia.

110 mm. of mercury), the operation should not be commenced. The abdomen can be shaved and prepared more conveniently than if he were in bed. The theater staff preparing for the operation should be instructed to carry out their duties quietly, and told that, as there is no undue haste, there is no excuse for clattering instruments.

Preparing the Pentothal Solution.—The anesthetist takes two 0.5 Gm. ampules of pentothal sodium and two corresponding ampules of sterile water. Providing himself with two 10 cc. syringes, he proceeds to fill each, and thus has two 10 cc. doses of a 5 per cent solution of pentothal sodium in readiness.

Having made the necessary preparation and having ascertained that the patient's condition is satisfactory, what may be termed the operation proper can be commenced.

TECHNIC OF OPERATION

Infiltration of the Abdominal Wall.—The skin from the umbilicus to the xiphisternum is infiltrated with 1 per cent solution of procaine hydrochloride. A midline incision is made in the skin. There is usually little or no bleeding. The edges of skin are grasped in a Lane forceps. After a little undermining of these edges of skin on either side, each rectus sheath is infiltrated with the local anesthetic thoroughly.

Introducing Pentothal into the Circulation (Fig.)—The saline solution must be running at a rate of at least 50 drops a minute. The anesthetist sterilizes the rubber tubing near the cannula and injects 0.5 Gm. of pentothal into the lumen of the rubber tube in exactly the same way as it would be injected directly into a vein, i.e. very slowly, 0.1 Gm. at a time. While the pentothal is being injected a nurse sits on the anesthetist's seat at the head of the table, encourages the patient, tells him to count loudly, and has her hands in readiness to hold the jaw forward should this become necessary. When the injection has been completed the anesthetist returns to the paient's head. Unconsciousness is sometimes delayed a little longer than in the case of a direct injection into the vein. Usually the respirations become somewhat shallow, and the patient tends to become cyanosed. In all cases the lower jaw must be held forward, and in many instances oxygen should be administered.

We shall assume that the patient has fallen asleep, that he is somewhat cyanosed and that the anesthetist is attending to him.

Opening the Peritoneum.—While the work just described has been proceeding, the surgeon has clipped towels to the wound edges, has completed the midline incision and has opened the peritoneum. Again, it is emphasized that there is absolutely no hurry. Time can be well spent sucking out fluid from the peritoneal cavity. If all is well with the patient, the operation proceeds, and after at lapse of five minutes a portion of the second 0.5 Gm. of pentothal is injected according to the needs of the patient. Usually after the lapse of five minutes the abdominal wall is well relaxed and the patient's color is a satisfactory pink. All that is necessary is to give just sufficient pentothal in 0.1 Gm. doses to keep him asleep; the local anesthetic is in full operation as far as the abdominal wall is concerned.

To illustrate what can be accomplished with this form of combined anesthesia, I sutured successfully a perforated gastric ulcer in a patient aged 80 at 2 a.m. in a small nursing home during an air-raid. As, owing to the circumstances, no medical assistance

could be obtained, a nurse injected the pentothal under my instructions.

RESUMEN

El autor ha hallado que la infiltración local con clorhidrato de procaína en combinación con la inyección intravenosa de pentothal sódico constituye un método excelente para cierta clase de operaciones de urgencia, especialmente en la úlcera péptica perforada, pancreatitis aguda y peritonitis difusa de cualquier origen. En el presente trabajo se describe detalladamente la técnica de este procedimiento anestésico.

RÉSUMÉ

L'auteur nous dit que dans certaines opérations d'urgence, telles que les opérations pour perforations d'ulcère peptique, pancreatites aiguës et péritonites diffuses, le chirurgien peut avec grand avantage avoir recours à l'infiltration locale avec l'hydrochlorure de procaine combinée à l'injection intraveineuse de pentothal sodium. Il décrit en détail la technique qu'il emploie et qu'il recommande.

Свод

Автор находит, что при некоторых срочных операциях, как перфорация желудочной язвы, острый панкреатит и общий перитонит от всякой причины, местная инфильтрация раствором кислой соли прокаина вместе с интравенозным вливанием соды пентотала является самой лучшей мерой. Дано детальное описание методики.

PROGRAM FOR TENTH NATIONAL ASSEMBLY OF UNITED STATES CHAPTER

(Continued from inside front cover)

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Supravaginal and Complete Hysterectomies

An Analysis of Indications, Results and Dangers

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PHILADELPHIA, PA.

THE supravaginal hysterectomy has been a standard gynecologic procedure for many years. It was one of the early types of abdominal operations and has held a high position among operations so far as cure or relief of the patient and her symptoms are concerned. Generally, it has been considered an adequate procedure that has not been too hazardous to the patient. Physiologic observations and knowledge accumulated in the last two decades have allowed tremendous extensions of surgical procedures, and what was considered adequate and successful surgery twenty years ago does not rank as such today. This statement applies to the surgery of all systems of the body, and of course it applies to the operations undertaken by the gynecologist. The supravaginal hysterectomy has been referred to as an incomplete operation, and this term seems best to describe its position among surgical operations at the present time. This does not mean that a supravaginal hysterectomy should never be done and that the procedure does not have a definite and established position in good surgical practice.

The complete hysterectomy has become an increasingly popular procedure in the past decade, and more gynecologists are finding reasons why this procedure should be done more often and why indications for it have become extended.

It is our purpose in this presentation to analyze and discuss some convictions which we have acquired in regard to the complete hysterectomy. These convictions are based on a study of 100 consecutive complete hysterectomies done at the Jefferson Hospital and The Philadelphia Lying-In Hospital over a relatively short period of time, and after a definite technic had been developed. In all instances the senior author was personally responsible for the patient and his technic was carried through at the operation. In a few instances the house officer or the junior member of the staff did the actual operation under the senior author's direct supervision.

THE SUPRAVAGINAL HYSTERECTOMY

The supravaginal hysterectomy has been utilized very generally as the operation of choice for benign uterine tumors which originate in the body of the uterus and for adnexal lesions. It has been successful in the relief of symptoms produced by such lesions as myomata uteri, adenomyosis uteri, functional uterine bleeding, partial descent of the uterus, pelvic inflammatory disease, endometriosis, endometrial polypi and benign uterine adnexal disease. In the presence of these conditions it has been thought advantageous or not disadvantageous to allow the cervix to remain. Some of the advantages which are attributed to the supravaginal hysterectomy have

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been the simplicity of the technic, the slight loss of blood, the absence of postoperative morbidity and the very low mortality. Besides these immediate advantages, great importance has been ascribed to the cervix as a fundamental structure in the human female. The preservation of the cervix has been thought to be necessary to maintain normal support of the vaginal vault and bladder, to maintain normal vaginal secretion and to prevent shortening of the vagina. With these facts as a basis, we have studied this series of cases and wish to discuss our convictions.

TECHNIC

We shall not discuss in detail the technic which has been used for the complete hysterectomy. However, we shall mention some pertinent points. Preparation of the vagina is accomplished by thorough cleansing followed by the use of some antiseptic, preferably an aqueous solution of zephiran chloride. This is done in the operating room, and, when necessary, it has been followed by a vaginal plastic procedure. A self-retaining catheter is placed in the bladder and is allowed to remain there for seventy-two hours following the operation. This was done originally because of the fear of injury to the bladder and the ureter, and it has been continued because it decreases the necessity for nursing care. It is our impression that it prevents immediate postoperative bladder dysfunction and immediate postoperative morbidity due to such dysfunction.

The technic of the hysterectomy proper is really an extension of the technic used for supravaginal hysterectomy. The bladder peritoneal flap is developed, and the ligation of the ovarian vessels is not at all different for the two procedures. The uterine vessels are ligated originally at about the site which one would use for the supravaginal hysterectomy, and then the uterine vessels are dissected from the uterus by cutting away the parametrium. One or two additional ligatures are necessary to control all the bleeding from the uterine vessels contained in the parametrium. The parametrium is dissected free from the cervix and upper part of the vagina as far as necessary. The uterosacral ligaments are then exposed, ligated and separated. Then the uterus is excised from the vagina. All the vessels are religated, and the vagina is closed with a continuous suture, so as to avoid as much as possible the development of persistent granulations in the vaginal canal. Many surgeons have found it unnecessary to close the vagina, but it would seem that some type of everting suture should be used to approximate the vaginal walls in either sulcus, even though the vagina is not completely closed.

The round ligaments and the utero-ovarian or infundibular pelvic ligaments are fixed to the vault of the vagina. Although this may not be necessary, it accomplishes two purposes: it fixes the vault of the vagina, and it helps somewhat to peritonealize the exposed pelvic surfaces. All raw surfaces are covered, and only one knot is exposed to the peritoneal cavity.

We prefer to use fine catgut suture, chromic no. 0, throughout the procedure, and we have the impression that this is good surgical practice.

The anesthetic we prefer is fractional spinal, with special consideration for small doses. In the series of cases which we are using as a basis for this discussion, 2 cc. of 5 per cent procaine hydrochloride solution in the spinal fluid was used as the initial dose and 1 cc. of the

solution was used as necessary to supplement the original doses. Usually 5 or 6 cc. of the solution was necessary to complete the operation, or a total of 250 mg. This type of anesthesia gives good and adequate relaxation, prevents dangerous depression of the blood pressure and allows for a careful and deliberate technic.

The time, trauma and loss of blood associated with the complete hysterectomy are not remarkably greater than with supravaginal hysterectomy. The immediate effects of the operation on the patient are essentially the same regardless of which procedure is used, and it would seem that the crux of the problem is which procedure gives immediately and ultimately the better results.

With these points in mind, we have studied this series of 100 cases.

The ages of the patients were distributed as shown in table 1.

TABLE 1

Age Distribution

Age, Years	No. of Patients
20–29	1
30–39	36
40–49	50
50–59	11
60–69	2

The average age was 44.0 years. There was only 1 patient in this series under 30 years of age, but on the basis of our experience we feel that there is no real objection to removing the cervix of a young woman when no endometrium can be conserved regardless of whether the adnexa must be removed or not. This statement is made deliberately and implies that the cervix per set serves no useful purpose in the woman who must have her uterus removed.

The extent of the operation and the additional surgical procedures are shown in tables 2 and 3. These are shown with the idea of demonstrating

TABLE 2

Type of Operation

	No. of Cases
Total hysterectomy, conservaton of adnexa	23
Total hysterectomy, partial removal of adnexa	26
Total hysterectomy, complete removal of adnexa	51

TABLE 3

Additional Surgical Procedures

	No. of Cases
Dilation and curettage	10
Appendectomy	22
Vaginal plastic operation	12

that routinely the disposition of the uterine adnexa is made without regard to the conservation of the cervix and that it is considered good surgical practice to conserve the uterine adnexa in all patients up to the age of 50 when they appear normal and when there is no indication of endocrine dysfunction in the patient's history. The number of additional procedures indicates that these can be accomplished without undue danger to the patient and can substantiate the concept that gynecologic operations are often multiple operations, accomplished with the idea of completely reconstructing the pelvic organs and relieving the patient of symptoms referable to the genital tract. Here again the conservation of the cervix need not have been considered.

Table 4 shows the incidence of febrile reaction following this series of operations. The incidence of 21 such postoperative reactions may seem high and

TABLE 4

Morbidity

	No. of Cases
Postoperative febrile reaction	21
Urinary tract infection	10
Perirectal abscess	1
Pyelitis and retained sponge in vagina	1
Thrombophlebitis	1
Wound infection	1

actually indicates an unexplained cause for febrile reaction for the seventy-two

hours immediately following the operation. This febrile reaction occurs frequently and is rather expected after many operations of an extensive nature. It need give no particular concern to the physician in charge of the patient and seems not to retard the patient's ultimate recovery. The number of patients with definite cause for the fever are given, and they are about the number and kind one would expect with any extensive operation. It is not shown in the table, but very likely the patients with pyelocystitis were the ones who were subjected to extensive bladder mobilization during the course of the operation.

No accidents were sustained at operation which could be directly attributed to the complete hysterectomy. One ureter was severed during an operation, but this accident would have occurred regardless of which type of hysterectomy was done. It took place during the release of an adherent adnexa, and after immediate care of the ureter a complete hysterectomy was done. No bladder injuries were known to occur. There was one intestinal injury. The small intestine was severed when an effort was made to free it from a large inflammatory mass in the pelvis. Immediate disposition of the injured intestine was made, and a complete hysterectomy was done. There has been no immediate or remote mortality in this series of cases, and no remote morbidity which we could ascribe to the type of operation performed.

In our series of cases the average number of hospital days following the operation before the patient's discharge from the institution (table 5) was fifteen and four tenths. The shortest stay in the hospital following the operation was eleven days, and the longest stay was forty-three days.

TABLE 5

Length of Hospitalization Following Operation

	Days
Shortest	11
Longest	43
Average	15.4
Mean	14

INDICATIONS FOR COMPLETE HYSTERECTOMY

In a presentation of this kind one should discuss some of the indications which are usually accepted for complete hysterectomy. Carcinoma of the cervical stump has been used as one of the chief indications. Carcinoma of the cervical stump has been observed 21 times in a series of 541 cases by Dr. Lewis C. Scheffey of Jefferson Hospital in his cases of carcinoma of the cervix. This alone would justify the removal of the cervix if the normal physiologic processes of the genital tract could be maintained and if the mortality and the remote morbidity from the operation did not overcome the effects it produces in lowered incidence of cancer.

FOLLOW-UP OBSERVATIONS AND COMMENTS

Our follow-up of these patients has been directed to determine some of the remote results which we think are important and which have not been stressed because of the importance placed on the danger of cancer occurring in a retained cervical stump after supravaginal hysterectomy.

In this series of cases of complete hysterectomies our interest is particularly directed to four points which theoretically could be influenced by removal of the cervix: (1) granulations in the vault of the vagina; (2) support of the vaginal vault; (3) shortening of the vagina, and (4) development of normal vaginal biology.

Granulations in the vault of the vagina have occurred in 27 per cent of our

patients and have usually been managed by curetting the granulation tissue a few weeks after the operation. If the granulations are not destroyed, it is our impression that they will produce an abnormal vaginal flora and consequently a leukorrhea. In our experience they have not been a troublesome problem, but they should and can be prevented with proper attention to closure of the vaginal vault. We think that the instances of their occurrence have become fewer as we have learned to close the vault of the vagina more meticulously.

The support of the vaginal vault is not dependent on the presence of the cervix. This statement is proved by the utilization of vaginal hysterectomy for the cure of prolapse of the uterus and of vaginal eversion. It has also been observed that prolapse of a retained cervix occurs not infrequently following supravaginal hysterectomy, but in our experience prolapse of the vaginal vault has not occurred following complete hysterectomy.

Our follow-up of this group of 100 patients has indicated that no vaginal shortening occurred because of the operation, and in some instances it was our impression that the vagina had been lengthened somewhat. In regard to this statement one should appreciate that there is a great variation in the length of the vagina in different individuals, and it is difficult to understand how the operation of complete hysterectomy could influence greatly the length of a structure which is so variable. It does not seem that either a supravaginal hysterectomy or a complete hysterectomy without vaginal repair could alter the length of the vagina sufficiently to interfere greatly with complete or satisfactory coitus.

Normal vaginal biology has been an important consideration with us in our follow-up study of this series of cases. Our studies have not been completed and some of our concepts are hypothetical, but it is our impression that normal vaginal biology exists after complete hysterectomy when the ovaries are conserved. This concept is based on the examination of a great many vaginal smears taken after complete hysterectomy with conservation of ovaries and after the use of estrogenic substances when the ovaries have been removed. Much importance should be ascribed to this concept, and it would seem that the value of complete hysterectomy as a standard and acceptable procedure can depend very largely upon this concept.

SUMMARY AND CONCLUSIONS

We have discussed the merits of two standard gynecologic operations, the supravaginal hysterectomy and the complete abdominal hysterectomy.

The supravaginal operation holds a definite and respected position in surgery and should be used when the opportunity has not been available to standardize a technic for complete hysterectomy.

We have used a series of 100 consecutive cases in which complete abdominal hysterectomy was done as a basis for our concepts, which are as follows:

1. The cervix per se is not an important structure when no endometrium can be conserved.

2. The mortality for complete hysterectomy may be slightly greater in a large series of cases. There was no mortality in this series of cases, nor has there been any mortality from complete hysterectomy at any time in our own experience.

3. The incidence of immediate febrile reaction is about the same for the two procedures. Theoretically, it should be less following complete hysterectomy.

4. We think that the remote morbidity is less after complete hysterectomy, and we have outlined briefly some of our criteria for this belief.

5. Finally, we believe that the complete hysterectomy is a complete operation that should be utilized by well trained gynecologists and that as one's experience grows its merits will become obvious and impressive. The supravaginal operation, however, must be utilized at times and will always retain its position as a valuable surgical procedure.

RESUMEN

Se estudian los méritos de dos intervenciones ginecológicas de tipo standard: la histerectomía supravaginal y la histerectomía abdominal completa.

La intervención supravaginal ocupa un lugar bien definido dentro de la cirugía y debe ser empleada cuando no se tenga la oportunidad de establecer una técnica standard para la histerectomía completa.

Nuestras conclusiones se basan en una serie de 100 casos consecutivos en los que se empleó la histerectomía abdominal completa. En resumen, las conclusiones alcanzadas son las siguientes:

1. El cuello por sí mismo no constituye una estructura importante en las circunstancias en que no pueda conservarse endometrio alguno.

2. La mortalidad correspondiente a la histerectomía completa puede que sea ligeramente superior en una serie más numerosa de casos. En la serie presente no se observó ningun caso de mortalidad, y en nuestra experiencia tampoco hemos tenido ningún desenlace fatal con la histerectomía completa.

3. La presencia de reacciones febriles inmediatas es aproximadamente igual con los dos métodos. Teoricamente deberían ser menores tales reacciones e seguidas de la histerectomía completa.

4. Estimamos que la morbilidad remota es menor a continuación de la histerectomía completa, y a este proposito hemos expuesto brevemente nuestro criterio.

5. Como final, creemos que la histerectomía completa constituye una intervención total que debe ser empleada por ginecólogos bien experimentados. Estimamos asimismo que los méritos de esta intervención se harán mayores y más patentes a medida que aumente nuestra experiencia en ese campo. De todos modos, la intervención supravaginal seguirá usándose en ocasiones y continuará manteniendo una posición propia y valiosa en la cirugía ginecológica.

RÉSUMÉ

Nous avons discuté les mérites de deux opérations classiques gynécologiques: l'hystérectomie supravaginale et l'hystérectomie abdominale complète. L'opération supravaginale a une position définie et respectée et sera l'opération de choix quand l'opportunité de se perfectionner dans la technique de l'hystérectomie complète n'est pas à la portée de l'opérateur. Nous avons fait une série de 100 cas consécutifs d'hystérectomie complète abdominale, et nous sommes arrivés aux conclusions suivantes:

1. Le cervix par lui-même n'est pas important quand tout l'endomètre doit être enlevé.

2. La mortalité de l'hystérectomie complète peut être plus élevé dans une grande série de cas. Nous n'avons eu aucune mortalité dans nos cas.

3. La réaction fébrile immédiatement consécutive à ces deux opérations est à peu près la même. Théoriquement, elle devrait être moindre après l'hystérectomie complète.

4. Nous croyons que la morbidité éloignée est moindre après l'hystérectomie complète. Nous avons énuméré brièvement les critériums de notre opinion.

5. Finalement, nous sommes d'avis que l'hystérectomie complète est l'opération de choix dans les mains de gynécologues entraînés. Avec l'expérience les mérites de cette opération deviennent plus évidents et plus impressionnants. L'opération supravaginale peut être utilisée dans certains cas et ne doit pas être abandonnée entièrement.

Свод и заключения

Взвешена сравнительная ценность двух общепринятых гинекологических операций, именно суправагинальной и полной абдоминальной истерэктомии.

Суправагинальная истерэктомия занимает определенное и важное место в хирургии и должна быть применена, если методика полной истерэктомии еще не вполне усовершенствована.

Следующие заключения были сделаны на основании 100 последовательных случаев полной абдоминальной истерэктомии:

1. Шейка матки сама по себе не является важным органом, если нельзя сохранить эндометрий.

2. Смертность при полной истерэктомии может быть выше в большом количестве случаев. В данной серии смертельности не было, и вообще во всем нашем опыте с полной истерэктомией.

3. Немедленное повышение температуры случалось в обеих операциях с той же частотой. Теоретически такая реакция должна быть более редкой при полной истерэктомии.

4. Мы думаем, что отдаленная смертельность меньше при полной истерэктомии. Мы даем краткий обзор наших соображений.

5. В заключение, мы верим, что полная истерэктомия это полная операция, которая должна быть произведена хорошо тренированными гинекологами, и, что по мере роста опыта, преимущество этой операции делается более очевидным и важным. Все же иногда необходимо применить суправагинальную операцию и она всегда будет занимтаь свое место, как ценная хирургическая мера.

The Newer Developments in Shock and Refrigeration

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TRAUMA and shock and their treatment always rank high in surgical importance, and they do so particularly in a time of war. Existing textbooks being out of date, an opportunity to review recent developments in a small monograph is hoped for; but the immediate military application is the reason for summarizing in this paper some details which may be better known to specialists than to the members of the medical profession in general.

It has been proposed elsewhere [1] that the word shock can be made precise by limiting it to its original surgical meaning and to designation of a few truly equivalent conditions; and the basic distinction between primary and secondary shock can be clarified by three contrasting features. Primary shock is of nervous nature, located in the arterioles and characterized by vasodilatation. Secondary shock is of metabolic nature, located in the capillaries and characterized by vasoconstriction. The word shock by itself is used to denote secondary shock, because of its greater importance.

The total evidence supports Phemister's contention [2] of the nonexistence of "neurogenic" secondary shock. Two qualifications are important. First, though nervous or primary shock is seldom fatal, the well known deaths from the vasodilator hypotension of spinal anesthesia illustrate the occasional exceptions. Second, pain, spinal anesthesia and all other causes of primary shock aggravate secondary shock or lower resistance to it. Therefore, spinal anesthesia is prohibited in secondary shock. The extent of the prevailing confusion is exemplified in claims that spinal anesthesia can be shockless like refrigeration if it is given low enough or if hypotension is counteracted by injection of epinephrine or a similar drug. The rudimentary fact is that no kind of nerve block inhibits secondary shock, and vasoconstrictor drugs are contraindicated in its treatment. It was necessary elsewhere [3] to criticize an assertion [4] that in cases of thigh amputations done with spinal or inhalation anesthesia "none of the patients suffered from shock during or after the operation." Refrigeration is unique as the only agency that inhibits both primary and secondary shock. Nobody can amputate a thigh without shock except under refrigeration. Strong patients may withstand the shock excellently, and surgeons may find reasons for preferring other anesthetics in spite of the shock factor. But the low mortality figures on which a few surgeons pride themselves are prima facie proof that they were dealing with patients strong enough to tolerate the shock. A very simple confirmation is furnished by the ability of patients to eat full meals before and after refrigeration operations and their inability to do so after subjection to other anesthetics. It is unnecessary here to add the claim of improved healing after refrigeration and the assured fact that refrigeration is the only form of anesthesia that has never caused any deaths.

OBSERVATIONS ON SHOCK

Unintentionally and unfortunately, the individual unaided research,[5] of which refrigeration was one feature, included other new findings which sweepingly contradicted the cardinal doctrines of shock which had been maintained by official and academic authority without challenge for a generation, but which were found to rest on defective experimental evidence or none. Although limited in methods, delayed for years and finally terminated by blocking of all opportunities and support, the following nine observations have apparently led to productive new investigations by others.

1. The tourniquet method for producing experimental shock was selected, standardized and demonstrated with respect to its advantages of convenience and freedom from complications. This use was begun long before the publication of Wilson and Roome,[6] on the basis of deaths encountered in ligations of legs at various temperatures and also of the scattered clinical reports of this kind. The newness of the standardization was attested by the published doubts concerning reliability (Noble[7]; Wiggers[8]) and the necessity of personal demonstration to several investigators. The wide laboratory adoption of the method definitely followed this paper.

2. The demonstration of the inhibition of shock by reduced temperature and its aggravation by elevated temperature was the first break in the universal practice of warming shocked patients or their injured parts. Besides the shockless anesthesia, this principle has found other applications, to be mentioned later.

3. The first idea of immunization against shock was introduced in experiments which failed because of the unfavorable environment. But Green and Bielschowsky[9] adopted the identical method successfully, and confirmations by Ungar[10] and Noble[11] leave no doubt of the fact that a series of graded injuries will enable an animal to withstand two or three times as much injury as would cause fatal shock in normal controls. Theoretically this contribution possibly favors the toxic element in shock, and practically it suggests a prophylactic value of the rough exercises used in training soldiers.

4. The demonstration that large intravenous injections of saline solution or plasma result in progressive accumulation of fluid in any injured region but not elsewhere in the body, and also that such abnormal permeability is absent in hemorrhagic shock, was the simplest and one of the earliest proofs that abnormal permeability is limited to the injured area, but it has received no mention in connection with more elaborate proofs by workers enjoying lavish facilities.

5. A dual theory of etiology was proposed: namely, that shock is a variable mixture of the two components of fluid shift and intoxication. The toxic theory of the governmental Shock Commission of the first World War was based on a very elementary blunder, namely, the incorrect weighing of animals' legs. Thus they missed the actual amount of local fluid exudation, which in many cases is clearly sufficient to account for death by a physical process without a necessary assumption of a chemical factor. But, apart from the disputed evidence offered by Moon and other upholders of intoxication, the new research stressed two points which had been overlooked by Phemister and Blalock in setting up the pure physical theory. First, their procedure had not been varied enough for establishing a general law, and their somewhat stereotyped

experiments allowed time for plentiful accumulation of fluid. The opinion that the severest shock which kills in the shortest time is accompanied by less than fatal local accumulation of fluid has been confirmed most recently by the Chess group,[12] who have also claimed to show evidence of intoxication by cross transfusion. Second, Phemister and Blalock failed to observe that the severest shock can be fatal even if sufficient plasma to maintain the blood volume is injected from the earliest stage. Since the cause was not nervous, the proof of a chemical factor seemed to be decisive. This proof has now been completed by the direct demonstration[13] of circulating chemical substances corresponding to the successive stages of shock. This brilliant work of the Chambers group has also confirmed the suggestion[5b] of differences in the shock produced by varying the components, i.e., by ligating large tissue masses for short periods or smaller tissue masses for longer periods. Presumably the response to treatment may be found to vary accordingly.

Although the dual mechanism in shock seems to be thus conclusively established, there is room for a plausible speculation that chemical substances in the injured tissues may be the cause of the abnormal capillary permeability and fluid exudation, and that these or related substances diffusing into the circulation may be responsible for the systemic vascular disturbances. In this way a unitarian toxic concept may possibly be established.

6. The prevailing theory of irreversibility of shock[8, 14] was corrected by showing that animals in the act of drawing their last breath could be revived and enabled to live twelve to thirty hours longer with a striking recovery of strength. The best revival was obtained with injections of saline solution in dogs with hemoconcentration, but of whole blood in dogs with hemodilution and in all rats; plasma was always inferior. Presumably the reservoir of hyporeactive toxin (Chambers) in traumatic shock made the ultimate outcome more hopeless than in hemorrhagic shock, since the Levine-Soskin group[15] confirmed this reversibility in hemorrhagic shock to the extent of complete recovery. Transfusion alone having always failed (this creating the legend of irreversibility), their success was accomplished with the aid of salt solution.

The fundamental significance of this changed viewpoint should be made clear. The doctrine of irreversibility assumed that hypotension, anoxia or other processes in shock caused injuries to the liver, adrenals, nervous system, heart or especially the general capillaries, which were inevitably fatal. The disproof of this doctrine reveals a large reserve function in these organs up to the ordinary time of death. This does not imply that a hopeless stage may not be reached later or that any shocked organism can be saved at any stage. It does remove an excuse for failure. It implies that many patients, especially under the former plasma treatment, have died at stages when they were still capable of temporary or permanent recovery. Death in the hopeless cases may be attributed either to lethal quantities of the hyporeactive substance (Chambers) or to further anoxial damage. But the ability to prolong life arouses hope and challenges workers to discovery of better injection fluids or other treatments, as will be mentioned later.

7. The misconception of endless leakage of plasma through damaged capillaries and the necessity of colloid injections to keep the blood stream filled was overthrown. When the tissue need for

fluid and electrolytes is satisfied, an equilibrium is established so that the circulatory volume is maintained, even though the injected fluid is plain saline solution and even though the blood is abnormally diluted. The exudation remains stationary, subject to increase with further injections but not spontaneously. These experiments and this principle in shock have been entirely ignored by later writers.

8. New evidence was brought showing the elementary fallacies in the potassium intoxication theory and in the adrenal cortical therapy of shock. The omission of the latter practice from the recent official memorandum [16] on fluid balance may help to terminate its lingering survival among some physicians.

9. This publication [5b] was the first to compare plasma and saline solution in shock treatment and to declare the latter equal or superior. Davidson [17] and Underhill [18] showed saline solution to be beneficial for burns (confirming its use for various conditions since 1831), but the tradition of superiority or necessity of plasma remained unquestioned. The official Shock Commission of the first World War became so enamored of a theory of colloid domination of the circulatory phenomena of shock that they set up this pure fancy as a dogma without any real proof of the alleged specific benefit of colloid solutions and harmfulness of crystalloid solutions in shock, but it is chiefly amazing that the wealthiest laboratories should have dutifully supported the authorities with ostensible experimental proofs for a generation. Since 1939 a series of investigators [18, 19, 20, 21] have reported variable comparisons between crystalloids and colloids. The lack of value in pure protein solutions or dialyzed plasma was demonstrated.[22] The failures with saline solution can be mostly explained by deficiencies in quantity or timing or by other technical factors, such as a hemorrhagic complication (crushing or ten hour ligation of legs). Saline solution was proved fully efficacious in the nonhemorrhagic shock due to venous obstruction.[23, 24] Finally Rosenthal,[25] making the most extensive tests on standardized burns in mice, proved that plasma or serum is strictly equivalent to the same quantity of sodium salts in noncolloid solution, and also is equally effective whether given by vein or stomach or intraperitoneally. The aforementioned experiments [5b, c] went farther, by producing shock of graded severity and proving that saline solution cured animals which were too severely injured to be cured by plasma. The therapeutic advantages of saline solution are that it is more conveniently and abundantly available, it can be tolerated safely in larger amounts, and, while it dilutes a concentrated blood, it also passes most rapidly into the tissues to supply their specific need for fluid and electrolytes.

Much incompleteness in this work obviously needed to be filled out. The awakened interest in fluids to replace plasma led to one and perhaps two preeminent contributions.

One of these was the work of Rosenthal, already mentioned, which ranked various salts of sodium as essentially equivalent, but with a slight preference for the lactate. Fox,[26] adopting Rosenthal's methods, used the lactate with conspicuous success in the clinical treatment of burns, but he also, with Keston, confirmed the fact that practically 100 per cent of mice with standardized burns are saved by plain isotonic solution of sodium chloride. Another step was to overthrow the basis of the plasma treatment, by proving that the protein content of the edema fluid in injured regions is derived from breakdown of the tissues

rather than from migrated plasma; thus fluid but not plasma protein needs to be supplied for this purpose. Most important therapeutically, however, was Rosenthal's introduction of the oral administration of sodium salts. Intravenous injections are needed, sometimes in very large amounts, but a more normal and less risky adjustment is obtained when as much as possible of the required salt solution is absorbed from the bowel. The Mylon-Winternitz group have ascribed greater specific virtues to the succinate and fumarate of sodium, but there is no general agreement among workers with varied methods.

It must still be admitted that the severest shock can be fatal in spite of any or all of these methods. Attention should therefore be directed to the findings of the Moyer-Coller group [18] as perhaps embodying a further preeminent contribution. By scalding anesthetized dogs by immersing two thirds of the body in water at 85 C. for thirty seconds, they produced shock which was fatal in a little over five hours. "Loading with plasma was surprisingly ineffective," but so also was isotonic solution of sodium chloride. Intravenous injections of Ringer-lactate solution were more beneficial, but the longest survival was obtained with saline–sodium bicarbonate solution. The difference between these workers' results and mine is found only in the timing of dosage. Ninety minutes before scalding, the Moyer-Coller group "loaded" the animals with a single intravenous injection of one of the various salt solutions to the extent of 10 per cent of the body weight, or with 2.5 per cent of plasma. I have previously observed that injections of saline solution prior to injury have little or no prophylactic value; but this is not the way shock is treated clinically and not the way to get the best results. Other authors have made the mistake of comparing only equal volumes of plasma and salt solution. Therapeutic conclusions should be based on comparisons of the optimal results obtainable with each fluid. In the previously mentioned experiments,[5] the method consisted in injecting isotonic solution of sodium chloride in such quantities and at such intervals as would best control hemo-concentration as judged by red cell counts. With this plan there can be no doubt of the great lengthening or actual saving of life with saline solution. The plasma for comparison was given in two ways, either in identical quantities with the saline solution or in such smaller quantities as would give the same control of red cell counts, and in each way it was inferior to saline solution. Workers having facilities can devise more accurate standards of control, probably based on plasma composition or plasma-tissue equilibrium; but the benefit of properly spaced fractional doses [19] is certain. Nevertheless in the most severe shock death occurs inevitably in spite of injections of any kind of plasma or salt solution, precisely as the Moyer-Coller group have stated, either from the shock itself or from the circulatory failure and pulmonary edema caused by the large fluid volume used to combat the shock. This is where their essential contribution appears, namely that animals of this class can be saved by combining administration of saline–sodium bicarbonate solution by stomach with transfusion of defibrinated blood. Reasons are given for objecting to either citrated or heparinized blood. With this new method, hematocrit values as high as 75 to 80 per cent were found not detrimental. Since anoxia is the specific cause of death in shock, and since mere administration of

oxygen has failed to benefit, it seems an attractive theory that the polycythemia without excessive concentration of plasma proteins may furnish a means of additional oxygen transport. It might then be of interest to try whether a suspension of red cells in saline solution [28] may serve the purpose as well or better. But the assertion of these authors that dogs with burns of such severity can be brought safely not only through shock but through the "toxic" after-period (one hundred hours' survival being equivalent to permanent recovery from this standpoint) is worthy of the utmost attention and testing. If confirmed, it is the farthest advance yet made in the fluid therapy of burns and other shock.

MEMORANDUM OF SHOCK COMMITTEE

A recent official memorandum [16] epitomizes information on the treatment of burns by administration of fluid, properly emphasizing the sharp distinction between the initial shock crisis of twenty-four to forty-eight hours and the subsequent period of convalescent or roborant treatment. Although carrying the weight of official authority, the document may be somewhat one sided by reason of the fact that all its authors until recently accepted the colloid theory without question, and that no originator of any of the new therapeutic advances has been admitted to membership in the Shock Committee or at least to participation in such an official pronouncement. The advances mentioned have only lately constrained the Blalock group to abandon doctrines which, as shown by the preceding review, were practically all wrong and mostly opposite to the truth. The immediate military importance of the problem may therefore be pleaded as a reason for comments from an unofficial progressive viewpoint.

(*a*) The total fluid recommended by the Committee for severe burn shock consists of 2,000 cc. of plasma, 4,000 to 10,000 cc. of salt solution, and an additional 2,000 to 3,000 cc. of either salt solution or water. This is the first intimation of acceptance of the six year old saline therapy by the Shock Committee or other representatives of the Committee on Medical Research or the National Research Council. This is a beneficent advance, because the colloid error cost high in lives. The huge amounts of fluid actually needed in shock and burns, as previously demonstrated [5, 26] and now endorsed by the Committee, could not be given with the necessary rapidity in the form of plasma even if the plasma were available. The old treatment of giving the supposedly specific plasma, usually in scanty supply, and avoiding salt solution for fear it would wash protein out of the circulation according to all the old textbooks,[14, 56] was obviously responsible for many unnecessary deaths. It is unfortunate that wounded and burned soldiers during most of the present war were treated according to this inheritance from the first World War, and that a large proportion of practicing physicians now receive their first official information of the mistake.

(*b*) The segregation of this small fraction of plasma from the other fluid under the special label, "to restore blood volume and to treat shock," appears as an effort to salvage respectability for a discredited theory, contrary to the facts of the last six years. The latter half of this statement implies that the only specific virtue for shock is contained in the small amount of plasma protein, and this is now known to be untrue. As has been explained in paragraph 5, the essential physical process in shock is the edema of injured tissues, and since former ideas of the protein

character of this edema have been disproved, the large volume of electrolyte solution which supplies this tissue demand must be regarded as the specific shock treatment and any other designation is unscientific. This wrong theoretical teaching, especially in a compend for beginners, can sometimes result in mistaken practice, as will be noted later in this report.

(*c*) The first half of the statement, "to restore blood volume," might refer to a complication or to shock itself. A complication in the form of external or interstitial hemorrhage or massive blood destruction creates a demand chiefly for red cells, plasma being only slightly superior to saline solution for this purpose. With acute bleeding to the extent of 45 to 70 per cent of the blood volume of dogs,[27] saline solution alone reduced the mortality from 84 to 58 per cent (even though used in insufficient quantity); heparinized plasma saved all animals and citrated plasma in the required quantities was toxic. But red cells suspended in saline solution are superior to heparinized plasma for hemorrhage.[28] As regards burns and shock, Rosenthal's mice did not require plasma to maintain their blood volume, and reference may be made to paragraphs 7 and 9 above, for proof that there is no difficulty whatever in maintaining blood volume with saline solution.

(*d*) Except for such hemorrhagic complications, the typical condition in shock, and particularly in burns, is hemoconcentration, varying according to the degree of shock. Rhoads [29] reported a case of severe burn in which intravenous injection of 5 liters of saline solution in nine hours did not suffice to prevent a rise of the hematocrit reading to 77 per cent. The logic of injecting additional protein into an already superconcentrated blood requires no comment. One reason for the superiority of saline solution in emergency treatment lies in its more rapid and efficient dilution of the excessively concentrated protein.

(*e*) Even in cases of depletion of total proteins or excessive administration of fluid, the incessant inculcation of fears of plasma protein dilution by saline solution in the crisis of shock is unwarranted. The aforementioned experiments [28] with washed red cells illustrate the previously proved [5c] ability of saline solution to maintain circulatory volume even with severe hemorrhage. The only edematous danger in uncomplicated shock is the congestion and edema of the lungs, which (contrary to the apparently prevalent supposition) is due not to deficient osmotic attraction in the blood but to circulatory breakdown. A normal animal can tolerate an amount of salt solution corresponding to 35 liters for a 70 Kg. man, intravenously injected as rapidly as 350 cc. per minute.[30] Injection of a far smaller amount of plasma will cause death from plethora with pulmonary congestion. The shocked organism, with general capillary permeability retained though not increased, and with extra permeability in the injured region, can be saved by the "dilution of plasma proteins to the edema level," against which the Committee warns; but in proportion as the injected fluid contains protein this safety valve of edema is clogged. While a great excess of fluid can be dangerous, animal experiments leave no doubt that the danger is much less with saline solution than with an equal excess of plasma.

(*f*) The foregoing reasons explain why saline solution is the best treatment in the terminal collapse of shock, as already proved experimentally (paragraph 6). This is where the teaching of students to regard plasma as the specific for shock can still cost lives.

The fact that extra protein is actually flushed out of the circulation by a large volume of any kind of salt solution in no way militates against the use or the benefit. The possible improvement by addition of blood or red corpuscles has been discussed in paragraphs 6 and 9.

(*g*) There is no proved basis for the advice that acidosis must be combated with alkali. Rosenthal's comparisons of sodium salts did not show differences of effectiveness according to alkalinity. The Mylon-Winternitz experiments indicated no differences in therapeutic results according to the presence or absence of acidosis. The role of sodium chloride in the maintenance of acid-base balance in the body is well known, and Joslin's notable success with plain isotonic solution of sodium chloride in the severe acidosis of diabetic coma (which also may be attended by anuria) seems to disprove the necessity of alkali for the comparatively trivial acidosis of shock. Exudates contain both the bicarbonate and the chloride of sodium, and the compensation for this migration may be the simplest explanation of the benefit of administering the mixed salts. Conceivably also the needed sodium may be best utilizable by the injured protoplasm in a neutral or alkaline solution or in some organic compound rather than the chloride. There is a need of clear experimental proof, first, whether the results obtained with plain saline solution under optimal administration can actually be improved on with any other salts; second, which of the present conflicting claims regarding bicarbonate, lactate, succinate, etc., is correct.

(*h*) In shock complicated by severe malnutrition, dextrose (*d*-glucose) solutions of 10 per cent or higher provide food with more or less fluid, or in severe dehydration 5 per cent dextrose solution can supply fluid parenterally without adding to a possible excess of salt. In a simple shock crisis, however, personal experiments have indicated the futility or harm of such attempts to improve strength or assist hepatic function. Dextrose thus used is theoretically objectionable on the same grounds as amino acids, which also have been recommended by some writers. Dextrose causes a moderate and amino acids cause a marked increase of metabolism, which means an extra demand of the tissues for oxygen in this state of anoxia. The average individual suddenly plunged into acute shock needs to have his metabolism fall to a minimum fasting level in order to reduce the tissue demand for oxygen, the principle being the same as in hypothermic treatment. Animals in advanced shock can easily be killed by injections of dextrose in aqueous solution, presumably through dilution of the vital electrolytes. All writers in manuals of the National Research Council lump dextrose and salt solutions under the name of "crystalloid" solutions, supposed merely to relieve dehydration, with no perception of their utterly different status.

(*i*) All are agreed that the end of the crisis marks a transformation in therapeutic needs. This is the time for every kind of enteral and parenteral feeding, dextrose, amino acids, vitamins, etc., which can now be assimilated, and blood transfusions for anemia if necessary. No organism is injured by or dies from protein deficiency in the crisis of uncomplicated shock. But in the post-shock stage the specious argument of replenishing depleted body proteins has greatest force, and this is where the Committee admits that injections of plasma are inconsequential for this purpose.

OTHER TREATMENTS OF SHOCK

The Committee's memorandum, limited to fluid and nutrition, makes only cursory mention of sulfonamide compounds and penicillin as additional therapeutic agents. Our group believe not only that refrigeration should have been included in this incidental mention but also that it was the duty of the Committee or the Council long ago to have supplied full, adequate advice on this treatment and the necessary equipment, especially for the armed forces. Before I proceed to this phase of the subject, brief mention should be made of one other specific shock treatment, namely local pressure.

In England, casts or compressive bandages for wounded limbs were introduced by Patey and Robertson [31] in 1941. The purpose of limiting exudation is the same as that of employing occlusive dressings for burns. The principle is so sound and the adoption has been so widespread that no comment is necessary except concerning incidental disadvantages. An effective pressure necessarily conduces to necrosis of tissues with low vitality or poor circulation, and under the incubating warmth of the thick dressings aseptic measures or bacteriostatic drugs fail to check the sloughing, putrefaction and toxic absorption. These considerations are akin to those which caused abandonment of the tight sealing of burned surfaces, and they may perhaps receive more attention with time.

Though the proof of the inhibition of shock and necrosis by low temperature and the aggravation by high temperature was published between 1937 and 1939, the tradition of warming shocked patients remained unchanged in the large institutions. Also, although the first announcements included shockless anesthesia of patients, continuance of the same opposition prevented wider trials, until in 1941 a demonstration in the City Hospital [32] of New York led to adoption of the method by numerous independent surgeons.

The benefit of reduced body temperature for shock was discovered by Temple Fay [33] in clinical observations begun in 1940 and announced in a panel discussion in 1942. The unanimity of authoritative opposition was such that Fay, with his pioneer work already under attack in other directions, did not press the contention further but continued to use the method routinely.

Blalock's repetitions of these procedures were open to the objection of faulty planning, whereby the animals all died; this resulted in misleading conclusions. Regarding treatment of shock by local refrigeration the conclusion [34] was that "lowering of the temperature of the part after the damage had been caused did not appear to exert a favorable influence". The summary [35] concerning reduction of body temperature stated: "The application of cold does not increase the chance of survival but is accompanied with a lengthening of the survival of an animal with a low blood pressure". "It should be emphasized that this paper does not offer evidence to the effect that the time-honored custom of warming the patient in shock is a bad one. Neither is it proved (or believed, for that matter) that measures to reduce below normal the body temperature of patients in shock should be initiated." Abbreviated references by a number of institutional writers convey the impression that Blalock was a pioneer in the development of hypothermia, but the official policy [14c] toward it has been in accord with the stated conclusions.

The rationale of systemic hypothermia is clear, in the constriction of super-

ficial vessels so as to provide more blood and oxygen for vital organs, in a reduction of exudation and a probable decrease of toxin formation, and especially in a reduction of total metabolism. Muddled thinking has resulted from the fact that shock is aggravated by exposure, which depletes body reserves, and shivering, which increases metabolism. The therapeutic purpose calls only for maintenance or support of the natural reaction to shock, with light covers or mild artificial cooling according to the environmental temperature, and particularly with avoidance of shivering or any sensation of discomfort. Recent work suggests that rectal temperatures of about 96 to 94 F. may be optimal. Scattered clinical observations [36] and abundant animal experiments [37, 38] leave no doubt that the difference between high and low environmental or bodily temperatures can amount to the difference between life and death.

The more radical hypothermia which can be applied locally to injured parts has the unique property of halting metabolism and simultaneously inhibiting pain, shock, exudation, infection, devitalization of tissues and formation and absorption of toxins. That this control of shock can be sufficient to save life is confirmed by unanimity of recent writers, experimental and clinical.[38, 39, 40] Besides its independent action, it is noteworthy that reduced temperature can thus remedy all the aforementioned defects in the local compression treatment and can reinforce the benefits. According to conditions and facilities, the treatment may range all the way from refrigeration near ice temperature to the mild cooling obtained by exposure, wetting of dressings with water or alcohol, or an air current from a fan. High temperature is inexcusable in any kind of shock treatment. From every standpoint the need is accentuated by hot weather or a febrile complication.

REFRIGERATION FOR TRAUMA, INCLUDING MILITARY WOUNDS

Wider uses of refrigeration have been and are being discovered by a number of observers, who are included in the aforementioned category of nonrepresentation in any official body. These advances pertain to conditions which often involve shock but also emphasize the control of pain, infection, intoxication and necrosis.

The rapid transformation of nearly moribund patients with infected gangrene by simple packing of the limbs in ice [32, 39] suggests a similar treatment for any dangerous infection of a limb. Theoretically, the apparent high oxygenation of blood and tissues under refrigeration should recommend it especially for anaerobic invasions. Confirmation is known in several unpublished cases, but apparently very few in military service have received the advantages as described by Ferguson.[41]

For embolism or thrombosis, refrigeration was first used [42] in the late stage of threatened gangrene to preserve a leg for several days or weeks until a weak patient could be strengthened for operation. In the early acute stage it may be expected to extend the time and improve the results of embolectomy.[1] Similar uses have been demonstrated for controlling pain, shock and infection and preserving limbs after trauma.[43] The time for which gangrene was thus held in abeyance has ranged from fifty-eight hours [44] or two weeks [45] to one month,[46] and the surgeons have made it plain that life could not have been saved without this interval for treating other injuries and building up strength. Since medical officers on active service can seldom keep informed on medical

advances without instructions from the responsible authorities, there have been no reports of the use of this method in the American armies, the naval reports [46] are few and recent, and chance examples [1, 47] illustrate the widespread lack of information. A private communication, however, states that the growing use of refrigeration is credited with saving lives in the latest Pacific campaigns.

The known fact that the thrombosis following severe freezing ordinarily represents not a direct killing of tissues by cold but a secondary effect of thrombosis has served as the basis for an important therapeutic demonstration,[48] namely, that prevention of thrombosis by three or four days of heparin treatment may bring about complete healing where otherwise sloughing would be hopeless. The usefulness of reduced temperature is thus augmented, for often the only way to prevent thrombosis or necrosis in the interval before heparin can be obtained will be to thaw the part to only a few degrees above freezing. Also the neurovascular consequences of either frostbite or immersion foot seem to respond best to prolonged cooling [39, 49] at skin temperatures in the neighborhood of 55 to 65 F., in combination with other treatments.

The simultaneous inhibition of pain, shock, infection, tissue devitalization and toxic absorption seems to recommend refrigeration as an ideal treatment for burns.[50] A single trial may convince anybody that the best emergency treatment for any burn is to plunge a limb into icewater or the coldest water obtainable or to apply ice to a trunk area. The pain and inflammation are most promptly relieved in this way, and the subsequent healing is most favorably influenced. Kross's case [51] showed a control of intoxication precisely similar to that in infected gangrene and beyond anything obtainable with bacteriostatic drugs, because the latter do not inhibit all kinds of bacteria and have no influence on tissue necrosis or the absorption of bacterial or tissue toxins. The control of pain without opiates, the elimination of destructive cleansing and time-wasting asepsis, the amelioration of both shock and the post-shock toxic state, and the unprecedented ultimate saving of tissue are among the claimed advantages. Any failure to reproduce these results will generally be of technical origin, since experience is an asset and prolonged maintenance of constant temperature without too much weight or encumbrance requires either watchful nursing or use of the special automatic electrical apparatus.* The technic may be summarized as beginning with refrigeration to near ice temperature (under protection of a single layer of petrolatum gauze) during the acute crisis of shock and intoxication for perhaps two or three days, after which the temperature is gradually raised as high as possible without causing a return of symptoms. In Kross's case this meant a skin temperature in the neighborhood of 60 F. for the greater part of eleven weeks. Though the treatment is simplest with the accurate and labor-saving apparatus, it can be managed aboard a warship or in any land location where ice is available. An added advantage is that this method can be combined with any or all other treatments of burns. Not only has a method of such promise for such a large class of casualties remained unknown and unused among the American armies, but it has been impossible to obtain the slightest aid or trial during four years of war.

Ice applications are proposed [39] as a

* Manufactured by the Therm-O-Rite Products Company, Buffalo, N. Y.

valuable routine in the treatment of snake bite and other venomous bites and stings, because of the control of pain, reduction of necrosis and toxic absorption and the promotion of discharge with incision and suction, with no tourniquet unless the limb is to be amputated. Retardation of absorption is illustrated by the injection of penicillin in chilled areas,[52] resulting in maintenance of effective concentrations in the blood for six to twelve hours and economy of the drug. The reported benefits[53] of the use of ethyl chloride spray for sprains may conceivably be equalled by regular refrigeration, with the advantage of superficial or deep penetration as desired. Many important further applications of refrigeration await only the opportunity for research, but there are indications[54] that the new developments are likely to be made in Russia because of the opposite official policy.

Shock is a metabolic condition which merely happens to have most often a surgical cause; therefore, the great mass of surgeons have been unable to judge the validity of theories offered by reputed authorities on such recondite matters as colloid therapy. But in their prompt adoption of a practical method such as refrigeration, surgeons have displayed an admirable competence of individual judgment against authoritative opposition. The individual initiative of medical officers of higher or lower rank has been the means of finally introducing refrigeration into the fighting services, with the recent support of official instructions in the Navy. The former arbitrary objection in other quarters that refrigeration was impracticable near the fighting fronts and especially in the tropics has been answered by the proved necessity of refrigeration preeminently in the tropics, because of the deleterious influence of the heat upon wounds and shock; and means for treatment have had to be improvised from the facilities provided for icing of food and drinks.

CENTRALIZED AUTHORITY

The great accomplishments of a free medical profession mobilized for a temporary emergency are already used as an argument for a permanent installation of such authority over practice and especially over research. The growing monopolistic control over medical information and policy must be evident to anybody who will notice the interlocking positions of the same few individuals in academic, governmental, scientific society, editorial and financial bodies. Other papers[3, 39] cited the stifling of the present independent research by this narrow domination of both public and large private funds, and also the secret policy of certain committees in dividing funds exclusively among their own members or a few favored institutions. It appears undeniable that if this work had emanated from within the select circle it would have received official welcome instead of suppression, funds would have been plentiful, and the facts of priority would have been more justly acknowledged in institutional literature. It seems scarcely accidental that this original work has received recognition by independent writers on either fluid therapy[18, 24, 25] or refrigeration,[39] while another group especially under Committee auspices make similar references when their reports are adverse[4, 19, 21, 22] but never when they are confirmatory in regard to either saline therapy[15, 23, 26] or refrigeration.[38, 55, 56] Under scientific freedom, the human fallibility of any individual or small group deserves charitable courtesy; but when such a

group wields a power to crush other workers and to impose its errors at a cost in human life, exposure becomes the only means of reform; and yet the monopolization explained above assures the most impressive presentation of the official case while embarrassing facts can reach only a few readers through a dwindling number of journals. The facts are not creditable to the system of machine science under remote control. An unrevealed fraction of over $15,000,000 of public funds expended by the Committee on Medical Research during three years of war crisis has been devoted to the important military problems of shock and refrigeration, without producing a single new therapeutic idea in either field. On the contrary, the Committee have held back new methods from use in the American armies, as shown by comparison of their own publications ** with what they have recently been forced to admit.[16] Without reference to the opposite advice of two years ago, this first official intimation of the discarding of the colloid anachronism and the adoption of saline therapy was promulgated just after the close of the German war.

CONCLUSIONS

As a result of advances in knowledge within the past six years, it appears to be finally agreed by official authorities that the fluid migration in the form of tissue edema or exudation, which is the essential physical process in shock, requires a fluid supply predominantly in the form of salt solution, and that the former colloid theory and highly advertised plasma therapy resulted in unnecessary deaths. Since the great majority of cases of shock are complicated by hemorrhage or other forms of loss of blood, the newer information suggests that the concept of fluid therapy can probably be simplified and adapted to the needs of individual patients on the basis of the following axioms. The specific for shock is salt solution. The specific for loss of blood is transfusion of blood, with plasma as a convenient but inferior substitute. The possible benefit of combating anoxia by addition of red corpuscles together with prevention of plasma concentration appears as an attractive theoretical deduction from the Moyer-Coller work.

There is ample proof that proper control of the environmental or bodily temperature and also the local temperature of injured parts is beneficial, sometimes to the extent of saving life. Local refrigeration is also capable of saving life or limb in a large class of traumatisms or infections, through its unique property of simultaneously inhibiting pain, shock, infection, necrosis, and formation and absorption of toxins. The treatment of burns is the newest development for which this method seems ideally suited.

** Instructions 14c, 57 in "Military Surgical Manuals, National Research Council", in 1943. "The application of warmth has become a well established part of the treatment of shock." Detailed advice is given for the use of blankets, hot water bottles, electric light cradles, etc.

The following typical statements on fluid therapy may be compared with those just published [16] by the same group. "It has been found that the giving of solutions of crystalloids, in the presence of capillary damage or of a fall in blood pressure from any cause, results not only in the escape of most of this fluid from the blood stream into the tissues, with resulting edema, but also in an additional loss of plasma protein." "It may be stated more precisely that solutions of crystalloids never should be administered to a patient who is in a condition of shock and whose total plasma protein has undergone severe reduction." "Solutions of crystaloids such as saline and glucose solutions have only a temporary effect. . . . Administration of plasma or serum, then, is the best treatment for burn shock." Examples are given of burn shock with fluid therapy limited to undiluted plasma in amounts of 2,500 cc. in five days to 7,350 cc. in fourteen days.

Refrigeration had already received medical endorsements both in this country and abroad,[58, 59, 60] but it is totally ignored in this and all other publications of the National Research Council and the Committee on Medical Research.

Combinations with other treatments are possible as may be desired.

The record of the official scientific advisers of the armed services is criticized as a warning against the perpetuation or extension of bureaucracy in medicine. Reversal of a fatal policy on fluid therapy was finally accomplished after one war was ended. Continued neglect of the various uses of reduced temperature has cost and is costing losses of life and limb, according to competent and impartial surgical testimony. Open protest is the only recourse after scientific arguments have been ignored. In any nonmedical war activity, reform would be accompanied by reorganization.

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REFERENCES

1. Allen, F. M.: J. Internat. Coll. Surg. **7**:423–435 (Nov.–Dec.) 1944.
2. Phemister, D. B.: Ann. Surg. **118**:256–268, 1943; J. A. M. A. **127**:1109–1112, 1945.
3. Allen, F. M.: Arch. Phys. Med. **26**:92–98, 1945.
4. Large, A., and Heinbecker, P.: Ann. Surg. **120**:707–742, 1944.
5. Allen, F. M.: (a) Tr. A. Am. Physicians **52**:189–194, 1937.
(b) Arch Surg. **38**:155–180, 1939.
(c) Am. J. Surg. **60**:335–348, 1943; **61**:79–92, 1943; **62**:80–104, 1943.
6. Wilson, H., and Roome, N. W.: Arch. Surg. **32**:334–345, 1936.
7. Noble, R. L., and Collip, J. B.: Quart. J. Exper. Physiol. **31**:187–199, 1942.
8. Wiggers, C. J.: Physiol. Rev. **22**:74–123, 1942.
9. Green, H. N.: Lancet **2**:147–153, 1943.
——— and Bielschowsky, M.: ibid. **2**:153–155, 1943.
10. Ungar, G.: Lancet **1**:421–424, 1943.
11. Noble, R. L.: Am. J. Physiol. **138**:346–351, 1943.
Toby, C. G., and Noble, R. L.: Canad. J. Research **22**:79–88, 1944.
12. Chess, S.; Chess, D., and Cole, W. H.: Arch. Surg **49**:147–155, 1944.
13. Chambers, R.; Zweifach, B. W., and Lowenstein, B. E.: Proc. Soc. Exper. Biol. & Med. **56**:127–129, 1944; Am. J. Physiol. **142**:80–93, 1944
——— and Clowes, G. H. A.: Surg., Gynec. & Obst. **80**:593–608, 1945.
14. Blalock, A.: (a) Principles of Surgical Care, Shock and Other Problems. St. Louis, C. V. Mosby Co., 1940.
(b) Surgery **14**:487–508, 1943.
(c) Burns, Shock, Wound Healing and Vascular Injuries: Chapter II. Shock, prepared and edited by the subcommittee on shock of the Committee on Surgery of the Division of Medical Sciences of the National Research Council, Military Surgical Manuals, National Research Council, Philadelphia, W. B. Saunders Company, 1943.
15. Levine, R.; Huddleston, B.; Persky, H., and Soskin, S.: Am. J. Physiol. **141**:209–215, 1944.
16. Harkins, H. N.; Cope, O.; Evans, E. I.; Phillips, R. A., and Richards, D. W. (Committee appointed by A. Blalock, Chairman of Subcommittee on Shock): J. A. M. A. **128**:475–479, 1945.
17. Davidson, E. C.: Arch. Surg. **13**:262–277, 1926.
18. Underhill, F. P.: Ann. Surg. **86**:840–849, 1927.
19. Swingle, W. W., et al.: Am. J. Physiol. **138**:156–165, 1942; **140**:197–204, 1943; **141**:329–337; 713–721, 1944.
20. Cournand, A.; Noble, R. P.; Breed, E. S.; Lauson, H. D.; Baldwin, E de F.; Pinchot, G. B., and Richards, D. W.: J. Clin. Investigation **23**:491–505, 1944.
21. Fine, J.; Frank, H. A., and Seligman, A. M.: J. Clin. Investigation **23**:731–741, 1944.
22. Mylon, E.; Winternitz, M. C., and de Sütö-Nagy, G. J.: Am. J. Physiol. **139**:313–324, 1943.
23. Katz, L. N.; Friedberg, L., and Asher, R.: Am. J. Physiol. **140**:65–71, 1943.
24. Scott, C. C.; Worth, H. M., and Robbins, E. B.: Arch. Surg. **48**:315–318, 1944.
25. Rosenthal, S. M.: Public Health Reports **58**:513–522; 1429–1436, 1943; **59**:637–658, 1944; **60**:378–381; 401–418, 1945.
26. Fox, C. L.: J. A. M. A. **124**:207–212, 1944.
——— and Keston, A. S.: Surg., Gynec. & Obst. **80**: 561–567, 1945.
27. Ivy, A. C.; Greengard, H.; Stein, I. F.; Grodins, F. S., and Dutton, D. F.: Surg., Gynec. & Obst. **76**:85–90, 1943.
28. McKee, F. W.; Laycock, C. F.; Martens, T. G., and Nicholl, R. J.: Surg., Gynec. & Obst. **78**:509–514, 1944.
29. Rhoads, J. E.; Wolff, W. A.; Saltonstall, H., and Lee, W. E.: Clinics **1**:37–42, 1942.
30. Cutting, R. A.; Lands, A. M., and Larson, P. S.: Arch. Surg. **36**:586–613, 1938; **38**:599–616, 1939.
31. Patey, H. D., and Robertson, J. D.: Lancet **1**:780–782, 1941.
32. Crossman, L. W., et al.: Arch. Surg. **44**:139–156, 1942.
33. Fay, T.: Pennsylvania M. J. **46**:332, 1943; J. A. M. A. **121**:1109, 1943.
34. Duncan, G. W., and Blalock, A.: Arch. Surg. **45**:183–194, 1942.
35. Blalock, A., and Mason, M. F.: Arch. Surg. **42**:1054–1059, 1941.
36. Waters, R. M.: J. A. M. A. **121**:783, 1943.
Perry, I. H.: ibid. **121**:966, 1943.
Wright, R. D., and Devine, J.: M. J. Australia **1**:21–27, 1944.
37. Elman, R.; Cox, W. M.; Lischer, C., and Mueller, A. J.: Proc. Soc. Exper. Biol. & Med. **51**:350–351, 1942.
Cleghorn, R. A.: Canad. M. A. J. **49**:363–367, 1943.
Wakim, K. G., and Gatch, W. D.: J. A. M. A. **121**: 903–907, 1943.
Antos, R. J.: Proc. Soc. Exper. Biol. & Med. **56**: 60–63, 1944.
Green, H. D., and Bergeron: Surgery **17**:404, 1945.
38. Ricca, R. A.; Fink, K.; Katzin, L. I., and Warren, S. L.: J. Clin. Investigation **24**:127–139, 1945.
Katzin, L. I.; Ricca, R. A., and Warren, S. L.: ibid. **24**:149–151, 1945.
39. Allen, F. M.: Am. J. Surg. **54**:170–184, 1945; Anesth. & Analg. **24**:51–65, 1945.
40. Allen, F. M.: Am. J. Surg. **60**:335–348, 1942.
Cole, W. H.: Arch. Phys. Therapy **24**:670–675, 1943.
Devine, J.: M. J Australia **2**:476–479, 1943.
Sellers, E. A., and Willard, J. W.: Canad. M. A. J. **47**:461–464, 1943.
41. Ferguson, L. K.: U. S. Naval M. Bull. **43**:697–706, 1944.
42. Crossman, L. W., and Hurley, V.: J. Internat. Coll. Surg. **5**:171–173, 1942.
43. Crossman, L. W.: Canad. Hosp. J. **21**: (Aug.) 1944.
44. McElvenny, R. T.: Surg., Gynec. & Obst. **73**:263–264, 1941.
45. Mock, H. E., and Mock, H. E., Jr.: J. A. M. A. **123**: 13–17, 1943.
Mock, H. E., and Tannehill, E. H.: Surg. Gynec. & Obst. **73**:429–433, 1944.
46. Ottaway, J. P., and Foote, J. F.: U. S. Naval M. Bull. **43**:1041–1043, 1944.
47. Taylor, F. W., and Tondreau, R. I.: U. S. Naval M. Bull. **42**:911–915, 1944.
Bowen, F. H.: U. S. Naval M. Bull. **44**:777–785, 1945.
48. Lange, K., and Boyd, L. J.; also Loewe, L.; Lange, K., and Rosenblatt, P.: Report presented at meeting of New York Academy of Medicine, May 16, 1945.
49. Webster, D. R.; Woolhouse, F. M., and Johnston, J. L.: J. Bone & Joint Surg. **24**:785–794, 1942.
Greene, R.: Lancet **2**:695–697, 1942.
Ungley, C. C.: Lancet **1**:681–682, 1942.
White, J. C.: New England J. Med. **228**:211–222; 241–247, 1943.
Liebesny, P.: New York State J. Med. **43**:2118–2123, 1944.
50. Allen, F. M.; Crossman, L. W, and Safford, F. K.: New York State J. Med. **43**:951–952, 1943.
51. Kross, I.: J. A. M. A. **128**:19–20, 1945.
Safford, F. K., and Nathanson, M. B.: Arch. Surg. **49**:12–22, 1944.
Crossman, L. W., and Allen, F. M.: Surg. Clin. North America, April 1945, pp. 361–370.
52. Trumper, M., and Hutter, A. M.: Science **100**:432–434, 1944.

53. Bingham: Mil. Surgeon **96**:170, 1945.
54. Yudin, S. S.: Am. Rev. Soviet Med. **2**:4–13, 1944.
Lobachev, S. V.: ibid. **2**:323–331, 1945.
55. Blakemore, A. H., and Lord, J. W.: J. A. M. A. **127**: 685–691; 748–753, 1945.
56. Crossman, L. W.: J. A. M. A. **128**:225, 1945.
57. Harkins, H. N.: Burns, Shock, Wound Healing and Vascular Injuries: Chapter I, Military Surgical Manuals, National Research Council, Philadelphia, W. B. Saunders Company, 1943.
Strumia, M. M.: ibid., chapter III.
58. Editorial, Lancet **2**:734–735, 1941.
59. Editorial, Brit. M. J., June 13, 1942, p. 727.
60. Council on Physical Therapy of American Medical Association: Handbook on Amputations, Chicago, American Medical Association, 1942.
Editorials, J. A. M. A. **122**:40–41 and 177, 1943.

RESUMEN

Como resultado de los conocimientos adquiridos en los pasados seis años parece ser que las autoridades médicas oficiales coinciden en estimar que la migración de líquido, en forma de edema tisular o exudado, que constituye en definitiva el proceso físico esencial del shock, requiere un aporte de fluido predominantemente en estado de solución salina; y asimismo se estima que la antigua teoría coloide y la tan pregonada terapéutica con plasma acarrea como resultado muertes innecesarias. Teniendo en cuenta que la mayoria de los casos de shock se hallan complicados por hemorragia o otra forma de pérdida sanguínea, la información más moderna que se posee sugiere una simplificación de la terapéutica con líquidos y su adaptación a las necesidades individuales de cada paciente sobre la base de los siguientes axiomas: La solución salina constituye el elemento específico en la terapéutica del shock. El método específico para remediar las pérdidas sanguíneas está representado por la transfusión de sangre, considerándose al plasma como un substituto conveniente pero inferior a la sangre. De los trabajos de Moyer-Coller parece deducirse una conclusión teórica de interés, a saber, el posible beneficio de combatir la anoxia mediante la adición de glóbulos rojos conjuntamente con la prevención de concentración del plasma.

Existen pruebas suficientes para afirmar que el control adecuado de la temperatura ambiente y también de la temperatura local de las partes lesionadas ejerce un efecto beneficioso de tal índole que se traduce en salvar la vida del paciente. La refrigeración local constituye también un procedimiento de salvar vidas o extremidades en una extensa variedad de traumatismos o infecciones, actuando simultaneamente por su propiedad singular de inhibir el dolor, evitar, el shock, infección, necrosis y la formación y absorción de toxinas. La aplicación ideal de este método parece corresponder a la terapéutica de las quemaduras. Segun sea de desear, este procedimiento puede combinarse a otra clase de terapéutica.

Se discute aquí la posición de los consejeros científicos oficiales de las fuerzas armadas como una advertencia contra la perpetuación o extensión de la burocracia médica. La equivocada posición de mantener una erronea terapéutica fué corregida sólo al final de la guerra. El haber olvidado, de un modo continuo, las diversas aplicaciones de la reducción de la temperatura ha costado y sigue costando pérdidas de vidas y de extremidades, segun testimonia la opinión quirúrgica competente e imparcial. Sólo queda la protesta pública cuando todos los argumentos científicos se dejan pasar ignorados.

RÉSUMÉ

Le progrès des dernières six années nous enseignent que la migration de fluides sous forme d'oedème des tissues ou d'exudation est la cause essentielle du choc et demande qu'on fournisse aux malades des quantités de fluide sous la forme de solution saline. La théorie colloide et le plasma sont responsables d'un nombre de décès. Puisque dans la majorité des cas le choc est accompagné d'hémorrhagie, le traitement spécifique

pour le choc est l'infusion saline. Le traitement spécifique pour la perte de sang est la transfusion de sang. Le plasma est un substitut commode, mais de valeur inférieure. Le bénéfice possible de combattre l'anoxie par l'addition de globules rouges avec prévention de concentration du plasma est une théorie attractive résultant des recherches de Meyer-Coller.

Il y a des preuves suffisantes que le contrôle de la température du corps et aussi le contrôle local de la température des tissus lésés a une influence bienfaisante et parfois sauve la vie du blessé. La réfrigération locale peut sauver la vie et un membre dans une grand nombre de traumatismes et d'infections. Cette réfrigération contrôle la douleur, le choc, l'infection, la nécrose et l'absorption des toxines. Les brûlures peuvent être traitées avantagement par ce procédé. Il est parfois désirable d'adjoindre d'autres traitements à la réfrigération. Il faut lutter contre la perpétuation et l'extension de la bureaucratíe gouvernementale médicale. On a déja abandonné plusieurs méthodes de thérapie fluide qui n'avaint donné que des résultats contestables. D'avoir négligé de faire usage des différentes méthodes d'abaisser la température a entrainé la mort et la perte de membres d'après le témoignages de hautes autorités chirurgicales. Il faut protester ouvertement quand les arguments scientifiques sont ignorés.

Свод

Повидимому, в результате научного прогресса за последние шесть лет, официальные авторитеты пришли к заключению, что перемещение жидкости в форме отека или эксудата, которое является главным физиологическим процессом при шоке, требует снабжение жидкости, главным образом, в форме салина, и, что прежняя коллоидальная теория и пользующаяся широким распространением плазмотерапия причинили излишнюю смертность. Так как большинство случаев шока осложнено кровотечением или другими видами потери крови, то более новые данные указывают, что идея терапии жидкостями может быть упрощена и приспособлена к нуждам индивидуальных больных на основании следующих аксиом:

1. Нормальный соляной раствор является специфическим средством при шоке.

2. Перелив крови является специфическим средством при потери крови, плазма являющаяся удобным, но определенно низшим суррогатом. На основании работ Moyer-Coller, при борьбе с аноксией, возможная польза от прибавления красных кровяных телец вместе с предотвращением концентрации плазмы является интересной теоретической дедукцией.

Вполне доказано, что правильный контроль наружной температуры или температуры тела, а также местной температуры поврежденных частей, является очень благотворным, иногда даже до степени сохранения жизни. Местное замораживание также может сохранить жизнь или член тела в очень многих случаях травматизма или инфекции, главным образом благодаря его особенности одновременно понизит боль, шок, инфекцию, некроз и образование и абзорпцию токсинов. Самым новым применением этого способа является лечение ожогов, к которым эта метода идеально подходит. Комбинирование с другими методами вполне возможно, если это желательно.

Отчет деятельности оффициальных научных военных советчиков очень критикуется, как предостережение против сохранения и распространения бюрократии в области медицины. Перемена рокового курса жидкотерапии была, наконец, достигнута после конца одной войны. Беспрерывное пренебрежение разных применений пониженной температуры принесло большую потерю жизни и членов тела, как показывает компетентный и беспристрастный хирургический опыт. Когда научные доводы игнорируются, то единственным средством является открытый протест. В немедицинской военной деятельности реформа была бы сопровождена реорганизацией.

A Method of Inguinal Herniorrhaphy

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THE more universally used herniorrhaphies employ the inguinal ligament as the anchoring structure. To use Poupart's ligament thus is absolutely wrong, not only because it has been found to be of unpredictable strength, but because its use distorts the oblate ellipsoid, which is precisely what takes place in the abdominal cavity during periods of increased intra-abdominal pressure. In the inguinal region the ellipsoid is circumscribed by the pelvic ridge, as observed at the ileopectineal line. Hence, as shown in figure 1, if the repair for an inguinal hernia uses Poupart's ligament, the normal ellipsoidal outline is disrupted by superimposition of a trihedral space. The boundaries of the trihedron are: the pubic tubercle inferiorly, the inguinal ligament laterally, the spermatic cord superiorly, Cooper's ligament posteriorly, and the abdominal wall anteriorly.

From mechanics one knows that such a distortion of a pressure sphere, and so one may consider the abdominal cavity for all practical purposes, leads to an increased unit pressure on this trihedral area, whereas elsewhere in a sphere the unit of pressure intensity or force is equal. Now if the straight side defect of the sphere is nonrigid, bending will occur and the maximum force will be exerted at a point "P," which is one-third the distance from "B" to "A". The actual force at "P" will equal the sum of the pressures present on "A–B".

For the sake of clarity let us consider some figures. The intra-abdominal pressure during forceful exertion was found to average 73 mm. of mercury. Hence, we can state that at any point on the circumference of the abdominal cavity there exists a force of 73 mm. of mercury per square millimeter. However, if this man has undergone a classic herniorrhaphy with the previously referred to trihedral projection, the distorted portion is subject to additional

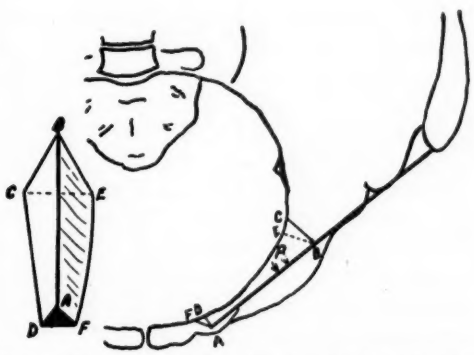

Fig. 1. Diagrammatic drawing showing the relations between the structures utilized in the ordinary operations for repair of inguinal heria.

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pressure. The hypotenuse or inguinal ligament portion of the trihedron, in a series of cases, averaged 62 mm. in length. It will be recalled that a straight side to a sphere is subject to the sum of the pressures exerted on this side; therefore, the pressure would be equal to 73×62, or a force of 4,536 mm. of mercury. This man's hernioplasty walls would have to resist roughly 62 times the amount of pressure exerted elsewhere in the abdominal cavity. Or, to state it in another way, the force in the abdominal cavity would be equal to 2.9 inches of mercury, whereas in the hernioplasty wall the pressure would equal a column of mercury 15 feet high.

Let us view the problem from another aspect. It is generally agreed that properly repaired hernias recur as direct hernias. Dynamics tells us that the maximum force is exerted at "P," or one-third the distance from "B" to "A". Hence, the point of maximum force, "P," would be approximately 20 mm. from "B," which would place this point just a few millimeters caudad to the deep epigastric vessels. This is the precise point where direct hernias become manifest, and thus to predict this point by the application of dynamics would tend to strengthen our contention that etiologically the inguinal hernia presents little more than the application of the fundamentals of dynamics.

The indirect hernia is due to an embryologic defect of tunica closure. The peritoneal out-pocketing does not seal smoothly at the orifice, and there remains a circular cylindroid projection, the apex of which is located at the sphincter formed by the encircling fibers of the internal oblique muscle, as described by Zimmerman. Hence, when this cone is converted to a single plane there is an equilateral triangle and the maximum force is exerted toward the apex. Actually, the force does not concentrate at one point but tends to expand the walls of the triangle. Each pressure wave will force a portion of the abdominal contents toward the apex, stretching the base until the circular cylindroid is converted into a prolate cylindroid and eventually a small portion of the abdominal contents overcomes the sphincteric action of the external oblique muscle and escapes. Hence, here again the mechanism is based on dynamics with an embryologic accident as the precursor.

There is still another variety of inguinal hernia. It is the saddle type, which owes its origin to the fact that as the indirect hernia develops the contiguous transversalis fascia is partially fixed and relaxed so that it is thrown into slight folds between the inferior margin of the internal ring and the pubic tubercle. When the abdominal cavity is under tension, the fixed portion of the transversalis does not tense and there is retained a variable trihedral defect. Again the factors outlined previously apply.

From our discussion, then, the ideal repair of an inguinal hernia must (1) preserve the original ellipsoid contour of the inguinal region, (2) completely eradicate all peritoneal projections, and, in addition, (3) provide a differential conduit for the transmission of the spermatic cord. The operative procedure that we propose satisfies these postulates.

The inguinal hernia is approached through a 5 to 8 cm. incision following the skin lines and placed midway between the pubic tubercle and the internal inguinal ring (fig. 2). The cord is approached in the usual manner except that the external oblique fascia is split not more than 1 cm. medial to the inguinal ligament. Whether there exists

an indirect or a direct hernia, we believe in opening the peritoneum at the internal ring and reducing the sac through this approach, the reason being that on occasion a very ill defined indirect sac is missed and even though the direct sac is taken care of adequately the patient returns with an indirect hernia.

After the sac is isolated, opened and pulled taut, the adhering structures are separated by both sharp and blunt dissection until the inferior edge of the sac extends into the abdomen perpendicularly. We consider this step of great importance, so that all peritoneal locules which might serve as nuclei for future hernial sacs are eliminated. As for ligation of the sac, we use a method of our own design (fig. 2). The sac is held taut, the abdominal contents visualized and a Furniss-Clute clamp applied across the proximal portion of the sac. The clamp is then closed and the corrugated sac transfixed with a straight needle carrying the suture. This method has the advantages of speed, simplicity, positive closure and minimizing of devitalized tissue.

The abdominal cavity is limited by the attachments of the transversalis fascia. In our opinion this fascia demonstrates considerable qualitative variation in the inguinal region. Hence, we are unwilling to depend on this fascia alone for support, and, furthermore, we hesitate to undertake massive fascial transplants routinely. For this reason the medial portion of the cut external oblique fascia is attached to the ligament of Cooper. This attachment is made by a series of interrupted sutures which take a small plicating bite in the extreme edge of the external oblique fascia, a plicating bite in the transversalis so that the latter structure is both tightened and strengthened, and finally a bite into Cooper's ligament to such a depth that a bit of periosteum is caught. These sutures are placed at intervals of 0.5 cm. along Cooper's ligament from the pubic tubercle to the ileopectineal eminence (fig. 2). However, the actual extent of these sutures is variable and is based on a definite and precise indication. That is, they are placed to a point where the dipped-in edge of the external oblique muscle just approximates, but does not compress, the illiac vessels as they enter the femoral canal. It is imperative that the iliac vein be observed for dilatation, since even slight pressure will reveal remarkable distal enlargement of this vein as seen in the wound. If there is evidence of pressure the last suture is cut, and since these sutures are spaced in close approximation the situation will be corrected. We have experienced no difficulty by accidentally including either the deep epigastric or the accessory obturator vessels in our sutures.

After the medial flap of the external oblique fascia has been anchored, the small lateral flap is brought around beneath the cord and sutured to the external oblique fascia medial to the newly created ring. This serves to enclose the cord snugly. The remaining portion of the lateral flap of the external oblique fascia and inguinal ligament is attached similarly throughout its length unless the inguinal ligament is too tight and tends to distort the contour of the internal flap. The cord is placed in the recently created trough, and the subcutaneous tissue and skin are closed.

We fully appreciate the fact that this operation does not attempt to conduct the spermatic cord obliquely through the abdominal wall, and, furthermore, we question its necessity. It is a maxim that external repair is inefficient for an opening in any wall that is subject to internal pressure. Hence, the inner sur-

face must be repaired so as to prevent the gain of any mechanical advantage by the existing pressure. This, we believe, is accomplished in our herniorrhaphy (1) by proper disposition of the peritoneum and any existent projections, and (2) by preparing a carefully placed abdominal wall conduit which is bounded by the external oblique and transversalis fascias in addition to the intervening contracting internal oblique muscle, which compresses the cord against the bony pelvis and iliac vessels during intervals of increased intra-abdominal pressure.

The only troublesome factor experienced in this procedure is placing the final sutures in Cooper's ligament, since at this position the iliac vessels lie very close. However, the index finger of the hand opposite from that using the needle holder serves both to protect the iliac

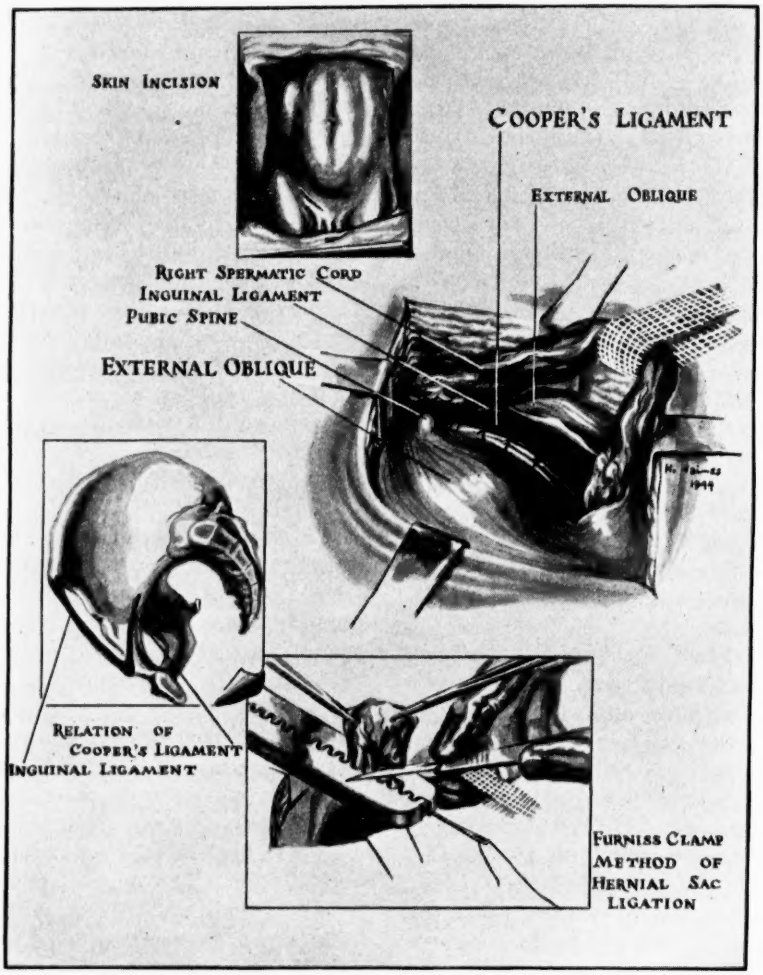

Fig. 2. The authors' method of repair of inguinal hernia.

vessels from the point of the needle and to palpate Cooper's ligament at the point where it is several centimeters from the wound surface.

We use cotton suture, no. 8 white cotton spool thread to attach the fascia to Cooper's ligament and no. 40 thread for all other sutures. However, the suture material used is of no significance provided that the postoperative course is governed accordingly.

On 89 patients we have executed 113 inguinal herniorrhaphies, 22 of which were for recurrent hernias. In the entire group we experienced only 2 recurrences, both of which represented technical failures and took place in primary hernias. Our first recurrence was early in the series, when we used only a single suture at the pubic tubercle; this suture failed and as a result of this defect there developed a hernia. The patient was a 63 year old blacksmith who admitted that he returned to "light work" within thirty days postoperatively; the "light work" consisted of "sharpening plow shears." The second recurrent hernia developed in a 43 year old clerk who presented a direct hernia at the initial operation, with no indirect sac visualized. Nine months later the patient returned with an indirect hernia with a definitely demonstrable preformed sac. Of the 89 patients, 59 have been examined on several occasions, varying from four to twenty-five months postoperatively, and 27 have been contacted by questionnaire alone. Only 3 patients of this group could not be found. It is of interest that none of the 22 recurrent hernias repaired recurred again. The majority of the patients do hard physical labor, and their mean age is 36.4 years.

This is certainly too small a series to permit any definite conclusions as to the value of an operative procedure, but in the light of these findings we feel that our observations on the etiology of inguinal hernia and the proposed operation merit consideration.

RESUMEN

Los autores describen un método de reparación de la hernia inguinal que llena los requerimientos que ellos estiman necesarios para una operación ideal. Tales requerimientos son en resumen los siguientes: (1) conservar el contorno original elipsoide de la región inguinal, (2) eliminar por completo toda proyección peritoneal y (3) proporcionar un conducto diferencial para la trasmisión del cordón espermático. En el método aquí descrito se emplea el ligamente de Cooper en lugar del de Poupart como la estructura de sostén. Los autores han usado este procedimiento con buenos resultados en 113 herniorrafias en 89 pacientes.

RÉSUMÉ

Les auteurs nous donnent une méthode pour la cure de la hernie inguinale et nous énumèrent les critériums pour une opération idéale: 1. Il faut conservar le contour original éllipsoide de la région inguinale. 2. Il faut supprimer complètement toute projection péritonéale. 3. Il faut créer un nouveau conduit pour la transmission du cordon spermatique. Dans leur méthode on utilise le ligament de Cooper plutôt que le ligament de Poupart pour prévenir toute récidive. Ils ont employé leur procédé dans 113 herniorrhaphies sur 89 sujets et ont obtenu d'excellents résultats.

Свод

Авторы описывают методу поправки грыжи, соответствующую их критериям идеальной операции, именно:

(Continued on page 469)

Management of Swallowed Sharp Foreign Bodies

Report of Perforation of the Appendix by a Common Pin and of the Cecum by a Toothpick

LIEUTENANT COMMANDER MORRIS WEINTROB, MC, U.S.N.R.
AND
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WHEN a young child swallows a penny or a cherry pit, the family's equanimity is rarely disturbed. Even the oversolicitous type of parent is set at ease by the doctor's reassurance that there is no need to worry . . . that "the baby will pass it and no harm will come of it".

If the swallowed object is sharp, it cannot be dismissed so lightly. The lay mind does not so readily believe that it can possibly pass without some dire complication . . . even if at the time of the examination the patient appears to be without any appreciable discomfort.

"Will an operation be necessary? Won't it perforate the stomach or some part of the bowels? Wouldn't it be better to attempt to remove it before it perforates? If so, at what point is it more likely to perforate? Wouldn't it be wiser to remove it before it reaches that point? How serious is swallowing such an object? Is the mortality high?"

"Wouldn't the x-ray show it up even if it is a toothpick (or a chicken or fish-bone)? What does one do to follow the progress of a foreign body that is non-metallic?"

These problems, of course, arise only if one knows or suspects that a sharp foreign body has been swallowed. Unfortunately, too often no such history is obtainable until after the abdominal exploration (most often performed with some other preoperative diagnosis in mind) has unexpectedly led to the discovery of such a foreign body.

In one of the cases herein reported the appendix was perforated by a common pin, and in the other the cecum was punctured by a toothpick. In the first a definite history of the child's having swallowed a pin was available. In the second case a diagnosis of acute appendicitis was made, the patient giving no history of having swallowed a toothpick.

These 2 cases together with another that was encountered in the same hospital during the previous year, an instance of perforation of the cecum by a toothpick reported by Zieman,[1] led us to review the literature in the hope that such a study would enable us to formulate definite principles of management.

WILL PERFORATION OCCUR?

Although swallowed foreign bodies do not usually pass through the gastrointestinal tract without some damage, the latter may be slight and symptoms or ill effects be absent. If passage through the esophagus takes place, the object will usually proceed through the stomach.

In a series of 48 cases of ingestion of foreign bodies by patients with mental disease, Carp[2] found that 83 per cent of the objects passed through the gastrointestinal tract without any apparent damage. These included pins, nails,

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needles, fishbones and sharp screws. In 17 per cent of the cases the foreign body became lodged in some portion of the alimentary canal.

McManus[3] described the perforation of a loop of bowel by a segment of wire 3 cm. long that occurred in an incarcerated hernia. Perforation under similar circumstances took place in 5 other instances in a series of 93 collected cases of intestinal perforation by ingested foreign bodies.

PERFORATION OF THE APPENDIX

During ten years of pathologic work in Montreal, Canada, Osler is said to have encountered exogenous foreign bodies in the appendix but twice. According to Fowler,[4] Heinick's experience in 3,750 autopsies was identical.

Deaver[5] stated that he had found but 1 case of perforation of the appendix by a foreign body, that being by a common pin. Reporting a case of his own and reviewing the literature up to 1912, Fowler noted perforation of the appendix in 48 out of 63 cases of swallowing of common pins.

PERFORATION OF THE CECUM

The literature contains numerous reports of widely varying types of foreign bodies that have remained within the cecum without having perforated. The cecum possesses little peristaltic action of its own. Emptying takes place as a result of reverse peristalsis passing proximally from the ascending colon to the cecum. This leads to compression of the latter organ, which in turn causes its contents to be forced distally into the ascending colon. Normal peristalsis in the ascending colon then propels the intestinal contents through the hepatic flexure toward the transverse colon. Metallic substances of "some weight," especially those with blunt ends that render perforation less likely, are not so easily moved by this play of mechanical forces and thus make up the greatest number of foreign bodies that remain for years within the cecum. Rosenstein[6] removed multiple metallic pieces, some measuring 17 cm. in length, from the cecums of mental patients who seemed to possess a voracious and capricious appetite for hardware.

On the other hand, perforation of the cecum by a wire nail 3 inches (7.5 cm.) long was described by Pike.[7] Most uncommon of all, perforation of the cecum by a fecalith was reported by McCreery.[8]

Perforation by a toothpick was reported by Vestal,[9] McLanahan,[10] Wallis,[11] McClintic,[12] McManus,[13] Melville[14] and Barrett and Leader,[15] which made a total of 10 such cases appearing in the literature from 1912 to 1942. The toothpick appears to have been the most common article causing perforation of the cecum.

Prat[16] described a number of cases in which pins were ingeniously removed from the cecum by manipulating them into the lumen of the appendix. Appendectomy eliminated the necessity of opening the large bowel.

DO THE FOREIGN BODIES CAUSE APPENDICITIS?

Although a foreign body may lie practically dormant in the appendix for some time, it probably lowers the resistance of that organ by producing a chronic irritation of the mucous membrane. Such an opinion was expressed by Lazarus,[17] who suggested that an attack of appendicitis in a patient suffering from grip at the time was made more probable because of the irritation by a pin that had been within the appendix for some time.

Perforation by blunt foreign bodies is purposefully not analyzed in this re-

port. Although grape seeds, other exogenous foreign bodies and fecaliths are occasionally seen in association with "ruptured" appendicitis, it is felt that in such cases the perforation is usually secondary to the inflammation that follows obstruction of the lumen by the impacted foreign body. Yet Meyer and Rossi, [18] adding a case of their own, mention 2 cases of primary perforation of the cecum by false teeth.

In Park's [19] 2 cases of perforation of the appendix by a common pin, symptoms of chronic appendicitis had existed for a long time. Operation was performed for a supposed acute exacerbation. In 1 case the pin was found in an abscess cavity, the appendix not being located. In the other the pin was present within a diseased appendix. The latter had ruptured, and an abscess was present.

One week after a patient of Engstad's [20] had swallowed a twig, the appendix was found to be perforated but not much inflammed. Marked inflammation was present in the surrounding structures. The twig was recovered from a peritoneal fold behind the cecum.

POSITION OF THE PIN

Usually, the pin enters the appendix head first. Generally, it remains straight, being bent upon itself rarely. In most instances it lies parallel to the long axis of the appendix.

The head of the pin in our case followed the usual course. The pin was somewhat bent, and its direction varied only a few degrees from that of the longitudinal axis of the appendix. In Rentschler's case [21] the pin lay with its tip toward the distal point of the appendix.

Occasionally, the head of a pin may ulcerate through one wall and its point perforate the opposite wall. The pin may remain free from deposit, become corroded and rusty and be either partly or completely covered by feces. Thus, it may serve as the nucleus of what may from gross appearance give the impression of an unusually long simple fecalith.

In several instances the head of the pin became surrounded by a concretion. The entire shaft has passed out of the lumen of the appendix. The "enlarged" head, acting as a ball valve, prevented complete exit from the appendix.

McBurney and Hirst (quoted by Fowler) each reported single cases in which two pins were found lying parallel to each other within the appendix.

TIME OF ONSET OF SYMPTOMS

One would suppose that a swallowed pin, toothpick or other sharp substance, such as a nail, a chicken bone or a fishbone, would lead to rapid perforation. As has already been previously stated, this is not usually so. Acute symptoms lasting less than ten days and not preceded by any previous attack were noted in only 13 of the 59 cases of perforation by a common pin collected by Fowler.

As a rule there is a gradual onset of abdominal pain, low grade fever and localized tenderness. A sudden and dramatic appearance of sharp pain that is constant and severe, accompanied by vomiting and soon followed by a general peritonitis, is rare. Nor does shock as seen after a ruptured peptic ulcer usually appear.

Perforation has occurred as soon as a few hours and as late as fifteen years after the swallowing of a pin. In the case described by Lazarus it took place after one and a half years, while in that of Gottesman [22] the patient, a young woman, when informed that a stick pin had perforated her appendix, recalled that the accidental swallowing had taken place some nine years previously.

Of possible interest in the field of workmen's compensation are the cases of Bell and Morriata, cited by Fowler. In each instance a swallowed pin had remained dormant in the appendix for years until "lighted up" by a blow on the abdomen.

Of special interest is the surprisingly small percentage of patients who before operation mention having swallowed a foreign body.

SIMULATION OF OTHER CONDITIONS

In practically all the cases involving perforation of the cecum, ileum, Meckel's diverticulum or the appendix, the symptoms were those commonly attributed to acute appendicitis. In *none* was perforation by a foreign body suspected.

Glazebrook (quoted by Lazarus) reported the case of a young child suddenly taken ill with chills and rapid breathing. It cried when moved about and referred its pain to the right anterior chest. Death took place three and a half hours later. Necropsy revealed a purulent appendicitis with a localized peritonitis. The appendix was perforated at its middle by a common pin. It was then ascertained from the parents that the pin had been swallowed ten months previously.

SITE OF PERFORATION

One might expect that the greatest number of perforations would occur proximal to the fixed points and relatively narrowed passageways of the gastrointestinal tract, i.e., proximal to the cardioesophageal junction, the pylorus and the natural angles in the first and second portions of the duodenum.

According to a review of 83 cases by McManus wherein the sites of the perforations were given, 53 took place in the ileocecal area. Thirty-three involved the appendix, which made that organ the one most frequently perforated.

FREQUENCY OF PERFORATION IN VARIOUS SITES

Stomach	2
Duodenum	1
Jejunum	2
Meckel's diverticulum	10
Ileum	10
Cecum	10
Appendix	33
Hepatic flexure	3
Transverse colon	1
Splenic flexure	2
Descending colon	1
Sigmoid colon	5
Rectum	3

Tenesmus, bloody stools and diarrhea were noted in all 3 cases of perforation of the rectum.

According to Deaver the first appendectomy on a living subject, performed by Claudius Amyard, was on a boy of 5 years. The indications for surgical intervention were an irreducible scrotal hernia accompanied by a discharging sinus of the right thigh. The appendix, wrapped in omentum, lay in the hernial sac. It had been perforated by a pin. The head of the latter, enveloped by fecal contents, was still within the appendix.

In 7 of McManus's cases in which the site of perforation could not be determined the foreign bodies were found lying within abscesses in various recesses of the peritoneal cavity. Thus, it would be well to keep in mind the possibility of perforation by a swallowed sharp foreign body as a remote cause of an obscure peritonitis.

Direct perforation of the appendix occurred usually near the base or at the middle. Fowler cited several interesting cases, for instance: Mitchel's, in which the point and shaft had pene-

trated the appendix, passed through the ileum and produced a small abscess between the ileum and the cecum, and Keen's, in which the tip of the appendix was adherent to the bladder, with which it had established a pathologic anastomosis. In the latter case a pin, encrusted by a calculus, was found in the bladder; worms and feces were discharged per urethram.

PATHOLOGY

Five main types of pathologic sequelae have been encountered.

1. In 18 per cent of cases an early localized peritonitis was found, usually with a metallic body plugging the small, acute perforation. In 88 cases of this type, the obstruction occurred in the ileacecal segment. Coils of the intestine were glued together by light fibrinous adhesions.

2. Indurated, inflammatory tumors occurred in 15 per cent of the cases. The perforating agent was well walled off by indurated omentum and visceral peritoneum.

3. Almost half, approximately 45 per cent, of the cases were characterized by abscess formation. In 1 instance this occurred in a hernial sac, and in 3 it was in the perirectal tissues. In Durham and Beltz's [23] case a toothpick lay free in an abscess cavity. Mitchel's review [24] in 1899 included 3 cases in which either a chicken bone or a fishbone lay within an abscess of the abdominal wall. These appear to have been examples of the migratory type described by Poulet.[25] Almost half of the abscesses were situated in the right lower quadrant of the abdominal cavity, being secondary to perforation of the appendix, cecum or ileum. The only mention noted in the literature of abscess of the liver following perforation by a swallowed sharp foreign body was that of 6 cases included in Mitchel's collected series. Only 3 of the 42 abscesses gave rise to fecal fistulae.

4. Twenty per cent of the cases (approximately 1 out of every 5) were accompanied by general peritonitis. Two cases followed perforation of the sigmoid, 1 perforation of the jejunum and 15 about 16 per cent) perforation in the lower ileal and cecal regions. Half of the foreign bodies were metallic objects; the other half, bony or wooden. General peritonitis was noted in the young as well as in the aged.

5. Hemorrhage was reported in only 1 case, that of Wolfer and Lieblien.[26] A large branch of the right gastric artery had been pierced by a fishbone that had penetrated the gastric wall. Death came quickly.

MORTALITY

Before 1900 the mortality in 34 reported cases was 53.5 per cent. In almost all of these surgical intervention had not been attempted. The patients who survived did so because the abscesses that had developed either drained spontaneously or did not require entering the general peritoneal cavity in order to approach them.

From 1900 to 1940, 6 deaths occurred in 60 cases, a mortality of 10 per cent. Four were due to general peritonitis.

The decidedly lower mortality rate in the twentieth as compared with that in the nineteenth century may be attributed to several factors. Modern asepsis has dissipated the ultraconservative attitude of the previous century toward entering the peritoneal cavity. Hence, sharp foreign bodies are removed even before perforation occurs. General peritonitis is recognized and effectively treated much earlier. The death rate has been greatly reduced by the Wangensteen and Miller-Abbott technics of preventing and treating abdominal

distention. It has been influenced also by attention to the problems of dehydration, protein and electrolytic balance and adequate fluid as provided by intravenous administration of dextrose in saline solution as well as of blood plasma. Supplemental multivitamin therapy plays an important part. Of inestimable value is the earlier localization of swallowed sharp metallic bodies, permitting removal either before perforation takes place or before a serious general peritonitis appears.

MANAGEMENT

Management of this type of case depends on a number of factors, among which are:

1. A knowledge of the swallowing of a sharp-pointed foreign body.
2. The character of the substance swallowed, whether metallic or nonmetallic.
3. The availability of x-ray and laboratory equipment.
4. The accessibility of adequate surgical facilities.

When such a body has passed into the esophagus, frequently repeated fluoroscopic and roentgenographic examinations are indicated. Since danger incident to a barium sulfate meal is practically nil, such a meal should be given as soon as possible. More definite localization of the foreign body will thus be afforded than is possible from the routine flat plates of the abdomen.

Since about 75 per cent of the perforations that have occurred took place through Meckel's diverticulum, the lower part of the ileum, the cecum or the appendix, no great concern need be felt until a foreign body reaches that segment of the gastrointestinal tract which is bounded by the most proximal and distal of these organs.

A statistical review at this point will be of assistance in formulating a plan of procedure for those sharp-pointed bodies that have arrived at the "critical segment".

In Carp's series of 48 collected cases, including instances of ingestion of both sharp and blunt objects, 17 per cent of the foreign bodies lodged in some portion of the intestinal tract.

In 6 of a series of 93 collected cases of perforation by an ingested foreign body, according to McManus, the perforation took place in the loop of an incarcerated hernia.

Fowler reported that perforation occurred in 48 of 63 cases of a common pin reaching the appendix—an incidence of 76 per cent.

The most frequent foreign body to perforate the cecum is a toothpick. Chicken bones, fishbones, toothpicks and long nails and hairpins are more prone to perforate the cecum than the appendix. Perforation, however, does not always occur.

The likelihood of perforation in the "critical segment" is as follows: Meckel's diverticulum, ileum and cecum, each about 12 per cent; appendix, about 40 per cent. When foreign bodies have managed to pass beyond the cecum, the incidence of perforation in the remainder of the intestinal tract in the case of sharp-pointed foreign bodies is still as high as 18 per cent. Half of the perforations take place in the sigmoid flexure, the others occurring (in order of decreasing frequency) in the hepatic flexure, rectum, splenic flexure and transverse and descending colon.

Certain conclusions may be drawn from the foregoing statistics. A common pin probably will reach the appendix before perforation is likely to occur. As soon as it has been definitely determined that the pin is lodged within the appendix, appendectomy is indicated.

Inasmuch as the toothpick and not the common pin has been the most common cause of perforation of the cecum, it seems unwise to attempt to milk a common pin from the cecum into the appendix with the view in mind of doing an appendectomy. Spontaneous progression usually occurs if a common pin has managed to escape incarceration within the appendix.

Should there be any unusual delay in the progress of a common pin to the appendix (as observed by frequent fluoroscopic examination) a rise in the sedimentation rate of the erythrocytes or in the temperature and pulse rate curves may indicate a slight perforation at the point of lodgment. Immediate laparotomy becomes advisable.

With all types of swallowed sharp foreign bodies, whether metallic or nonopaque, close observation of the sedimentation rate, temperature and pulse are indicated. This is especially important in the case of toothpicks, chicken and fishbones and other nonopaque substances, since the x-rays are of no assistance in determining their progress.

If the roentgenologist attempts to determine whether a pin is still within the appendix from a study of the films alone, he may find himself in error. In the case hereinafter described the first report by the roentgenologist was based on a review of the films brought by the patient to the hospital. The pin did not appear to be in the lumen of the bowel.

Subsequently, under fluoroscopic examination, the pin was found to move with the appendix during respiration. This led to the conclusion that "the pin may be in the wall of the appendix."

After the appendix had been removed and opened along its longitudinal diameter, an explanation for the roentgenologist's inability to state definitely whether the pin was either in or outside of the appendix was obtained. Barium had failed to enter the distal third of the appendix, in which the pin lay. Hence that portion of the appendix did not visualize.

When treating patients with mental disease, one should always consider the possibility of perforation by a swallowed foreign body as a cause of abdominal pain.

Persons wearing an upper dental plate have lost the tactile sensation in the palate provided by nature as a safeguard against accidental swallowing of foreign bodies that are at times present in food. Most of the patients who had perforations by toothpicks wore upper plates. Meat rolls are often cooked with toothpicks inside them. The cooking partially softens the wood and makes detection more difficult even when an upper plate is not worn. The custom of serving club sandwiches and hors d'oeuvres with toothpicks seems to have given rise to a gastronomic hazard.

In obscure cases of peritonitis it may be well to bear in mind the possibility of a sharp foreign body as the primary cause.

REPORT OF CASES

CASE 1.—D. B., an 18 year old Air Cadet, swallowed a common pin on March 3, 1944. Five days later, he felt a pain in the right lower quadrant of the abdomen. Roentgen study of the gastrointestinal tract after a barium sulfate meal located the pin in the vicinity of the appendix.

During the ten days following the swallowing of the pin, he was up and about. His only complaint was a sense of discomfort felt when he moved hurriedly. After the first few days he had been forced to discontinue calisthenics and running because of actual pain when he attempted to engage in such activity.

His bowels moved normally; his diet was general. On the 20th of March, seventeen days after he had swallowed the pin, he was admitted to a naval hospital. The series of

roentgenograms which he brought with him were interpreted as follows:

"A review of the films made between March 9 and March 14 shows the pin to be in approximately the same location. It does not appear to be in the lumen of the bowel."

Several factors during the week that followed his admission to the hospital served to delay the decision to perform a laparotomy. The interpretation by the x-ray department was rather indefinite. In fact, the impression

Fig. 1 (Case 1). Roentgenogram depicting a common pin in the right lower quadrant of the abdominal cavity. It was impossible from this film to determine whether the pin was still embedded within the appendix or whether it was lying free within the peritoneal cavity.

obtained was that the pin was outside of the intestinal tract. In view of this opinion it was felt that it might be wiser to await a more definite localization before making any attempt to remove the pin surgically. The presence of the pin did not seem to bother the patient except psychically. He complained of no pain even when going to and from the "head."

Urinalysis, a Kahn test, white blood cell and differential counts, red blood cell counts and determinations of hemoglobin gave normal results. The temperature, pulse and respiration were all normal.

On March 29, 1944, a fluoroscopic check-up examination was reported as follows:

"There is barium in the appendix. During respiration the pin is seen to move up and down with the appendix. There is no barium around the pin. This suggests that it may be either in the wall of the appendix or outside the latter; at any rate it is inside the abdomen."

Fig. 2 (Case 1). The point of a common pin is visible through the thinned-out serosal layer of the appendix. The serosa is being forced ahead of the advancing pin as perforation becomes imminent.

Fig. 3 (Case 1). Roentgenogram of the appendix after removal. A slightly bent common pin is present in the distal quarter of the appendix. Barium-coated fecaliths are visible. The most distal of these visualized fecaliths was 7 mm. distant from the nearest part of the pin. This explained the difficulty experienced by the roentgenologist in attempting to decide whether the pin was within the appendix or whether it was free within the peritoneal cavity. On fluoroscopic examination the pin was seen to move with the appendix during respiration. Thus it was possible to conclude that the pin was still embedded in the appendix.

Once again, the report from the x-ray department was somewhat inconclusive. One thing, however, was definite. The pin had not progressed beyond the site at which it had been visualized almost three weeks previously. Even though the x-ray report stated that the pin might be outside the appendix, the fact that it seemed to move with the latter during respiration was significant.

Reasoning that the pin was probably imbedded in the wall of the appendix, it was

decided that an exploratory laparotomy was indicated. Although the patient had no subjective pain at the time and tenderness on palpation was not elicited, his being subject to sea duty or extracontinental service was a factor in the decision.

Spinal anesthesia was employed. The "silent abdomen" produced by such anesthesia was most helpful. Furthermore, perforation of a hollow viscus, such as is incident to active intestinal movements while a patient is under general anesthesia, was less likely to occur with spinal anesthesia.

The pin was located without any difficulty, lying in the distal third of the appendix. The head of the pin was near the tip of the appendix. It appeared to be lying partly within the lumen and partly within the wall of the appendix. Its tip could be visualized clearly as it caused the serosal layer to bulge. Perforation was imminent but had not yet taken place. Appendectomy was done. The postoperative course was uneventful. The cadet returned to duty a month later.

Nothing of note was found on pathologic examination to determine whether the presence of the pin had led to the development of chronic or acute appendicitis.

When the appendix was opened along its longitudinal diameter it was evident that barium had not adhered to the pin. This accounted for the roentgenologist's inability to state definitely whether the pin was either within or outside of the appendix. The pin was slightly bent.

The appendix was examined roentgenographically after its removal. The findings were reported as follows:

"The portion of the appendix that was removed is 9 cm. in length. Its greatest diameter is 1 cm. There is a straight pin 27 mm. in length in the distal end of the appendix. The head of the pin is at the distal end of the lumen. The proximal half, including the point, is imbedded in the wall of the appendix. About 2 mm. of the distal end of the pin projects into the subserosal layer. In the proximal 6 cm. of the appendix there are barium deposits that outline several fecaliths. The most distal fecalith is approximately 7 mm. distant from the nearest portion of the pin."

CASE 2.—E. P. B., S 2/C, was admitted to a naval hospital on Jan. 1, 1944. His chief complaint was pain in the right lower quadrant of the abdomen. This was his first attack.

Generalized abdominal pain appeared on the day previous to his admission. He vomited once only. The pain persisted throughout the night. By morning, localization of the pain in the right lower quadrant of the abdomen was definite. The pain was intense.

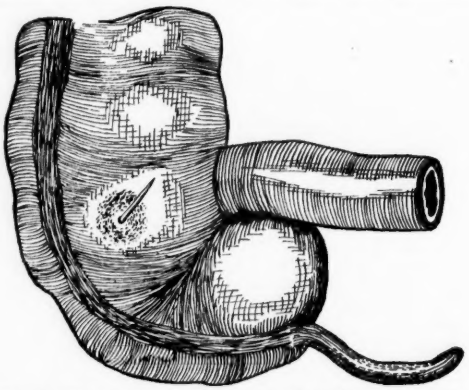

Fig. 4 (Case 2). Toothpick perforating the cecum on its anterior aspect. A fibrinous purulent exudate covered the appendix. The site of perforation in the cecum was effectively plugged by the toothpick. The peritoneal cavity was free of intestinal contents.

General examination revealed nothing significant except tenderness, muscular spasm and rebound tenderness in the right lower quadrant of the abdomen. The white blood cell count was 18,000, of which 88 per cent consisted of segmented polymorphonuclear leukocytes. Urinalysis and Kahn tests gave normal results. The oral temperature was 100.6 F. The preoperative diagnosis was acute eppendicitis.

A McBurney incision was employed. Spinal anesthesia was the anesthetic of choice. When the peritoneal cavity was opened the appendix was seen to be covered by a purulent exudate. Protruding through the anterior wall of the cecum was a toothpick. The latter thoroughly plugged the point of perforation. Local necrosis in the wall of the cecum at the site of penetration was clearly evident. The peritoneal cavity was free of any intestinal contents.

The toothpick was removed, and the site of

perforation was closed by inversion. Appendectomy followed. The abdomen was closed without drainage. Postoperative progress was uneventful, and the patient returned to duty at the end of a month.

SUMMARY

A review of the literature revealed that most perforations of the gastrointestinal tract are by sharply pointed metallic objects.

Fifty-three per cent of perforations occur in the ileocecal region. Perforation of the bowel lying within a hernial sac was reported in 6 cases.

Fifty per cent of the patients reported on presented symptoms lasting from a few hours to two weeks before being operated on. The remainder gave histories lasting over much greater periods, in several instances as much as ten to fifteen years.

Five types of pathologic manifestations were noted: early localized peritonitis, inflammatory masses, abscesses, general peritonitis and hemorrhage.

The mortality dropped from 53.5 per cent in the cases reported prior to 1900 to 10 per cent in those reported after that arbitrarily selected date.

One is justified in viewing the swallowing of sharply pointed foreign bodies with grave concern until these are located and removed.

The management of such cases is discussed.

Detailed reports and illustrations of a case of perforation of the appendix by a common pin and of one of perforation of the cecum by a toothpick are given.

BIBLIOGRAPHY

1. Zieman, S. A.: Perforating Foreign Body of Cecum, Naval M. Bull. **41**:1103–1105 (July) 1943.
2. Carp, L.: Foreign Bodies in Intestine, Ann. Surg. **85**: 575–591, 1927.
3. McManus, J. F.: Perforation of Intestine by Ingested Foreign Bodies, Am. J. Surg. **53**:393–402 (Sept.) 1941.
4. Fowler, R. H.: Foreign Body Appendicitis, Ann. Surg. **56**:427–436 (Sept.) 1912.
5. Deaver, J. B.: Appendicitis, Philadelphia, The Blakiston Company, 1905.
6. Rosenstein, P.: Foreign Bodies in Cecum, Deutsche med. Wchnschr. **47**:1099 (Sept. 15) 1921.
7 Pike, J. B.: Foreign Body in Cecum Simulating Appendicitis, Brit. M. J. **2**:413, 1919.
8. McCreery: Perforation of Cecum, Med. Rec. **81**:418 (March) 1912.
9. Vestal, P. W.: Perforation of Cecum by Foreign Bodies, New England J. Med **203**:1199–1200 (Dec.) 1930.
10. McLanahan, S.: Perforation of Cecum by Toothpick, Simulating Acute Appendicitis, J. A. M. A. **95**:1424, 1930.
11. Wallis, T. H.: Perforation of the Cecum by Toothpick, J. Florida M. A. **17**:127–129 (Sept.) 1930.
12. McClintic, B. S.: Perforation of the Intestines by Foreign Bodies, Mil. Surgeon **75**:75–78 (Aug.) 1934.
13. Lazarus, J., and Friedland, H.: Perforated Appendicitis Due to Foreign Bodies, with Special Reference to Domestic Pin, J. Internat. Coll. Surgeons **4**:353–357 (Aug.) 1941.
14. Melville, C. B: Perforation of Small Intestine by Swallowed Foreign Bodies, Australian & New Zealand J. Surg. **10**:146–156 (Oct.) 1940.
15. Barrett, W. D., and Leader, L. R.: Perforation of Cecum by Toothpick: Case Report and Review of Literature, Harper Hosp. Bull. **1**:120–122 (May) 1942.
16. Prat, L.: Extraction Through Appendix of Pin in Cecum, J. de Chir. **15**:624 (Feb.) 1920.
17. Lazarus, D.: Foreign Bodies in Appendix: Case (with Inflammation), Arch. Pediat. **51**:802–806 (Dec.) 1934.
18. Meyer, K. A., and Rossi, P. A.: "Morning Star" Fecaliths, Illinois M. J. **63**:362–364 (April) 1933.
19. Park, R.: Appendicitis Secondary to Common Pin, M. Rec. **47**:345, 1895.
20. Engstad, J. E.: Perforation of the Appendix by a Twig, Minnesota Med. **15**:603 (Sept.) 1932.
21. Rentschler, C. B.: Perforated Appendicitis Secondary to Common Straight Pin: Case, Am. J. Surg. **40**:485 (May) 1938.
22. Gottesman, J. L.: Acute Diffuse Suppurative Appendicitis: Case with Ceco-appendicular Fistula and Foreign Body (Straight Stick Pin) in Appendix, M. Rec. **142**:190 (Aug.) 1935.
23. Durham, D. C., and Beltz, A.: Abscess from Swallowed Toothpick, J. A. M. A. **94**:1930, 1930.
24. Mitchell, J. F.: The Presence of Foreign Bodies in the Vermiform Appendix with Special Reference to Pointed Bodies, Bull. Johns Hopkins Hosp. **10**:35–40, 1899.
25. Poulet, A.: Treatise on Foreign Bodies in Surgical Practice, New York, William Wood & Co., 1880, vol. 1.
26. Wölfer and Lieblein: Die Fremdkörper des magen-darm Kaffals, Neue deutsche Chir. Lfg., 1909, vol. 46.

RESUMEN

Pasando revista a la literatura se halla que la mayoría de las perforaciones del tracto gastrointestinal son producidas por objetos metálicos muy afilados.

El 53 por ciento de las perforaciones tienen asiento en la región ileocecal.

En 6 casos se da cuenta de perforaciones intestinales en el interior de un saco herniario.

El 50 por ciento de los pacientes aquí referidos presentaban síntomas de una duración variable entre unas pocas horas y dos semanas antes de ser intervenidos. El resto mostraba una historia de mucho mayor duración, llegando en varias ocasiones a períodos de diez a quince años.

Se observaron cinco tipos de manifestaciones patológicas: peritonitis precoz localizada, masas inflamatorias,

abscesos, peritonitis generalizada y hemorragia.

La mortalidad descendió desde el 53.5 por ciento correspondiente a los casos descritos con anterioridad a 1900 hasta un 10 por ciento correspondiente a los casos descritos despues de la obtención de los presentes datos.

El cirujano ha de considerar como un factor de peligro la deglución de instrumentos u objetos afilados, debiendo tomarse las medidas adecuadas para la localización y extracción del cuerpo extraño. Aquí se estudia el tratamiento de esta clase de casos.

Se describen con detalle e ilustraciones un caso de perforación del apéndice con una alfiler y otro de perforación cecal con un palillo de dientes.

RÉSUMÉ

La revue de la littérature nous révèle que la majorité des perforations gastro-intestinales sont dues à des objets métalliques pointus. Cinquante-trois pour cent des perforations intéressent la région iléo-cécale. La perforation d'une anse intestinale herniée fut observée six fois. Cinquante pour cent des malades présentèrent des symptômes de quelques heures à deux semaines avant d'être opérés. Les autres datèrent leurs symptomes pour de plus longues périodes, dans quelques cas de dix à quinze ans. Les manifestations pathologiques suivantes furent observées: péritonites locales, masses inflammatoires, péritonites généralisées, et hémorrhagies. La mortalité, qui était de 53.5 pour cent avant 1910, n'est aujourd'hui que 10 pour cent. Les objets pointus ingérés par la bouche demandent des soins précoces. Le traitement indiqué pour les perforations traumatiques est discuté. Entre beaucoup de cas, l'auteur rapporte un cas d'appendice perforé par une épingle ordinaire et aussi une cas de perforation du coecum par un cure-dent.

Свод

Обзор литературы показывает, что большинство перфораций желудочно-кишечного тракта причиняется остроконечными металлическими предметами.

53% перфорация происходит в тонко-слепокишечной области. Внутрегрижевая кишечная перфорация была доложена в 6 случаях.

50% больных, описанных в этом докладе, проявили симптомы от нескольких часов до двух недель до операции. Остальные больные дали гораздо более продолжительную историю болезни, в нескольких случаях от десяти до пятнадцати лет.

Были установлены пять патологических типов: ранний локализированный перитонит, массивное воспаление, нарыв, общий перитонит и кровотечение.

Смертность по сравнению с докладами до 1900 года упала от 53.5% до 10%, дата эта будучи избранна произвольно.

Вполне оправдывается серьезное отношение к проглатыванию острых посторонних тел. Требуется их немедленная локализация и удаление.

Описана методика таких случаев. Дан подробный доклад и иллюстрации случаев перфорации чревовидного отростка обыкновенной булавкой и слепой кишки зубочисткой.

A METHOD OF INGUINAL HERNIORRHAPHY

(Continued from page 458)

1. сохранить элипсоидальный контур ингвинальной области,
2. вполне искоренить перитонеальные выступы, и
3. создать отдельный канал для corda spermatis.

При этом способе Куперовая, а не Пуппартовая связка употребляется, как якорь. В 113 операциях грыжи над 89 больными результаты этой методы были хороши.

IN MEMORIAM

GEORGE SANFORD FOSTER, M.D., F.I.C.S.

George S. Foster was born on April 20, 1882, in Barrington, New Hampshire. After his graduation from Tufts College Medical School and internship at Boston City Hospital, he settled in Manchester, New Hampshire, where he practiced throughout his career. He was surgeon at the Notre Dame Hospital in that city from 1906 to 1925, and afterward at the Lucy Hastings Hospital. His postgraduate studies were extensive; he attended clinics in Switzerland, Austria, England, Scotland and France, as well as in the United States. He was a member of the Manchester Medical Association, the Hillsborough County Medical Association, the New Hampshire Medical Society, the New Hampshire Surgical Club, the American Association for the Study of Neoplastic Diseases, the New Hampshire Academy of Science, the Medical Officers' Association, United States Army, the American Medical Association and the American Medical Editors' and Authors' Association. In 1942 he was assigned as Lieutenant Commander in the Navy and stationed in Hawaii. Later he was ordered to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., as assistant to Captain Louis H. Roddis, who heads the Board of Medical History. At the time of his death he was busy writing the "History of Naval Medicine, World War II." His publications have included numerous articles on varied surgical subjects in different periodicals, including several in the *American Journal of Surgery* and in *International Clinics.*

DR. MAX MEYERHOF, F.I.C.S.

A Tribute

With the passing of Dr. Max Meyerhof in Cairo on April 20, 1945, not only Egypt but the whole world lost one of the most versatile and outstanding personalities and scholars of this generation.

Born on March 21, 1874, he came of an old German Jewish family whose residence in Hildesheim dated back to 1720. On both sides of the family pronounced talents were evident both for science, particularly medicine, and for historical research. On his mother's side was the outstanding gynecologist Prof. Dr. Otto Spiegelberg, of Breslau and Goettingen, and likewise his cousin, Prof. William Spiegelberg, the famous Egyptologist of Strassburg. Another cousin, Prof. Otto Meyerhof, whom in 1900 he accompanied to Egypt, suffering from a renal complaint, is the famous chemist and physiologist who was awarded the Nobel prize for medicine in 1932 and who since 1940 has been practicing in the United States at the University of Chicago.

Apparently Dr. Meyerhof's first stay in Egypt exercised such a fascination upon him that in 1903 he settled in Cairo as an oculist.

The marked family talents for medical and historical research not only exercised a deciding influence on his choice of a career; they fused in a unique synthesis in the personality of the great oculist and the great orientalist.

On the foundation of an excellent training under Professor Uhthoff, of Breslau, Dr. Meyerhof soon built up an extensive oculist's practice. At the outset he and kindred spirits founded a polyclinic for the treatment of the poor. He also immediately began bacteriologic and clini-

cal work on the extremely prevalent Egyptian infectious ocular diseases, and he published every year, as a result of this research, articles on the causes and treatment of the main Egyptian ocular diseases, some in German and others in French and American journals, and later also in the *Bulletin of the Egyptian Ophthalmological Society,* of which he became an honorary member in 1930.

In addition to this extensive activity in both the practical and the scientific sphere of ophthalmology, he turned as early as 1907 to the study of ancient Arabic ophthalmic science. And it was here that his real genius for the history of Arabic Medicine first found expression, in studies which remained an absorbing passion up to the end of his life. He quickly learned Arabic—partly under Professor Littman but chiefly by his own efforts—and had soon mastered nearly all the Semitic languages. Thus he had access to original manuscripts, from which he published many hitherto unknown writings. Later he devoted himself more and more to the general history of medicine and the natural sciences of the Arabs and opened up to research unsuspected material in the sphere of medical history. The result was an endless series of valuable writings dealing with the history of the sciences in the Arabic Middle Ages.

It was no wonder that the authority on Arabic medical history quickly became known and appreciated. He was soon elected a member of the Academy of the History of Sciences in Paris and of the Royal Society of Medicine in London. Later he became a member of numerous societies. In 1928 he received the honorary degree of Ph.D. at Bonn University. He became first a member and then vice-president of the Institut d'Égypte in Cairo, vice-president of the Société Royale de la Médecine d'Égypte in Cairo, and likewise of the Society of Friends of Jerusalem University, and an honorary member of the International College of Surgeons. On the occasion of his seventieth birthday, last year, Jerusalem University published in his honor a bibliography of his collected works. It includes over 300 publications and monographs, and is a worthy memorial of the great life's work of Max Meyerhof.

It must be left to more competent persons to estimate in detail the vast achievements of this great man as ophthalmologist, orientalist, student of Arabic medical history and connoisseur of the Art of the Near East. These lines are merely an attempt to capture his personality as a whole and preserve it as an inspiration to posterity.

It is surely no mere chance that Dr. Meyerhof felt himself so attracted by the personality of Maimonides, who nine hundred years ago worked in the same place as physician, student of natural science, scholar and philosopher. The fruit of this unique spiritual affinity between the two great physicians is "The Medical Work of Maimonides." * Particularly interesting to surgeons is his publication of the Papyrus Edwin Smith, "the oldest book on surgery in the world," and his illuminating interpretation of it resulting from his ability to explain it at first hand from the original text in his hieroglyphics.

Mention must be made of the fact that in 1930 Dr. Meyerhof felt obliged to refuse the offer of a professorship of Medical History at Leipzig University because he already foresaw that the nationalistic attitude of mind prevailing among the students at that time would not guarantee freedom of speech and freedom to teach for the future. As I look back, it seems to me that he was always the finest possible representative of the academic spirit of the old Germany.

As one exchanged ideas with him and tasted of his inexhaustible knowledge, one realized that the history of medicine is at the same time the history of human culture, and that the urge to study the historical problems of mankind profoundly arises from a most intense feeling for life, which leads the individual concerned to strive to enlarge the mental horizon of

* The Medical Work of Maimonides, in Essays on Maimonides, W. S. W. Baron, New York, 1941.

his age by a revelation of the truth behind historical processes. His lifelong preoccupation with such problems, the merging of his personality with them, produced this universal scholar-personality.

But this attempted portrait of the great man would remain too colorless and one sided if it did not include mention not only of his great intellectual gifts but also of his imaginative and artistic side. He knew and used to relate Arabic fairy tales like a professional story teller; he knew, too, countless anecdotes which in his vivid retelling were transformed into fairy tales. His love of plants and flowers he owed in the first instance to the inspiration of the great botanist Georg Schweinfurth, who was a personal friend of his. He was likewise a connoisseur and collector of oriental carpets, on which he was considered an expert not only by merchants and amateurs but by directors of museums. He also had a wide knowledge and deep understanding of Persian, Arabic and Coptic art.

His house was a place of refuge to all exiles from Europe, to whom he was always ready to give both advice and practical help. It was also a center for scholars from all parts of the world. In the last months of his life, orientalists from Russia and students of Medical History from the United States of America were meeting under his roof, so that, while his home was an intellectual center for ethnographers, orientalists, botanists, egyptologists and research scholars of every kind, he himself was unconsciously a mediator between East and West.

What lent his personality its tremendous attraction was that the development of his great intellectual powers went side by side with deep human sympathy. His creative power, linked with his goodness of heart, gave him harmony and universality. And with all this he combined a modesty that was truly touching.

As an oculist Dr. Meyerhof had been for decades in Egypt an almost symbolical figure whose name had become synonymous with the recovering of sight to the blind. He will be mourned by his countless patients and also by his friends and fellow scholars all over the world.

Prof. Dr. Hugo Picard,
Cairo, Egypt.

Editorials

Reflections Following Victory

WE rejoice in one of the immediate results of the recent cessation of the tragic military struggle. With restrictions on travel and the holding of meetings almost eliminated, surgeons from all over the United States can again come together for fellowship and exchange of ideas. Accordingly, the Tenth Annual (Victory) Assembly of the United States Chapter of the International College of Surgeons will be held in Washington, D. C., on December 6, 7 and 8, 1945.

It is significant that this meeting is to be held in Washington. Not only is this city the capital of the United States, and hence an ideal place for discussion of matters of national and international concern, but it is the city of incorporation of the International College of Surgeons (founded in Geneva, Switzerland, in 1935).

With the leadership of Dr. Herbert Acuff, the President of the United States Chapter of the College, and Dr. Custis Lee Hall, of Washington, the General Chairman, coupled with the efficient cooperation of the various committee chairmen, this scientific assembly will yield much that is worth while.

* * *

We are heartened by the opportunity to hold this meeting. We are pleased that we shall have with us some of our members already released from military service. We are glad that in some ways, in some places, the restrictions and inconveniences imposed by the war are over. We are delighted because the actual dangers of war are over for the members of the armed forces of many nations. We are happy because the suffering of civilians in some parts of the world has already been eased, and that there is opportunity to bring relief to others. Let us hope that the scientific discoveries made in wartime can now be put to *constructive use,* and that the gradual return of surgeons and other professional men from the military services will release more manpower for constructive work. Let us, from a personal standpoint, be stimulated to renewed activity because we have an organization of international integration to help us in our planning.

* * *

In this hour of glad tiding let us, nevertheless, not forget the gloomy conditions still present in the world which are disheartening, or our responsibilities toward the peoples of the world and toward the civilization of the future. Let us not forget that in many countries children have been so weakened by physical exposure and lack of food, and by mental and emotional stress, that only by a miracle of humanitarian science can they become normal adults and useful citizens. Let us not forget that the education of young people all over the world has been so interrupted and handicapped that unless prompt and energetic action is taken a future gen-

eration may have a serious shortage of well trained scientists. Let us not forget that the hardships and inconveniences experienced by individual countries may bring forth outbursts of nationalistic desire to seek economic and physical security and benefits for themselves first and foremost, and in the struggle for attainment forget, perhaps, that this can no longer be a world with segmental isolation, that *integrated effort is necessary for the welfare of all.* We must be mindful that unless all thinking people of *all professions* combat these tendencies to isolation and selfishness one of the causes of the war may be quickly renewed.

* * *

The United States Chapter of the International College of Surgeons is the largest unit of an international organization. To them, composed of Americans, the challenge to counteract nefarious "isms" and intolerances in their "incubation period," and, yes, destroy them, if need be, is real and beckoning. All men of medicine are conversant with the aberrant and destructive functions of certain neoplastic cells. They know their potentialities for evil and dangers to normal life, and they know the cure. This holds true whether a single cell or myriads are affected and on the rampage. Americans have never lost a war, and when finally convinced of the justness of a cause they can and will resolutely conquer any and all evils besetting a diseased world. Their influence for good is historic. After the Victory Assembly in Washington, our leaders and constituents will, in March 1946, take advantage of the International Assembly in Lima, Peru, at the invitation of the Peruvian Government, and under the leadership of the distinguished Dr. Francisco Graña. We look forward at that time to an interchange of thought between representative surgeons from all over the world. The spirit of the Assembly will be aided by the sympathetic attitude of the great Peruvian government, under whose sponsorship the Assembly will be held. This international assembly should play an important part in establishing sound and cooperative international relations among surgeons.

The Tenth Annual Assembly of the United States Chapter must do its share in this movement, as well as play a specific part in helping to solve the concrete problems presented by the world of today and the world of tomorrow. It must be more than a meeting of surgeons of the United States to listen to presentations of scientific reports by surgeons of note. Its fellowship must be more than an interchange of cordialities and ideas between individuals who come to the same lecture hall or banquet room. Reports of the latest scientific developments can be read in medical and surgical journals; congenial people can be found in any gathering, national or local. This must be *more than another meeting,* just as *the International College of Surgeons is more than a surgical society.*

In this conclave there will be a reaffirmation of the desire of the members to extend a helping hand to their less fortunate brother surgeons. They must subscribe to the blotting out for all time of the possibility of other "Belsen beasts" and their degreed henchmen; they must make their voices of resentment heard in unison on physical and mental atrocities perpetrated on human beings. One finds it impossible to discover the reason for the mental gymnastics performed by those who squander fortunes in money and in publicity so that the world may see their crocodile tears over "vivisection" yet

whose voices are complacently silent on the subject of the atrocities visited by some men on their helpless fellows.

American civilization, American manhood and American sense of justice all revolt at this grotesque discrepancy. Americans will never permit a *laissez faire* attitude—Yes, the American hearts that beat in the chests of those men on Corregidor will reaffirm their determination that it shall never happen again.

* * *

In some way the Victory Assembly of the United States Chapter must be an active expression of the purposes of the College and of the universal humanitarian aims of world-minded surgeon-citizens.

MAX THOREK

Vistas Before Us

MEN of science in every land welcome the dawn of peace. The clouds of war appear to be lifting from the horizon of the future. Social and political tyranny is in the process of being suppressed in every country where freedom of thought and action is the basic ideology. May the day never return when fine young men and women born with a hope for usefulness in a world of opportunity have their lives terminated prematurely by the ravages and atrocities of war!

The innate desire for freedom in the hearts of the millions of every tongue and race as much as the prowess of men and material resources must be given credit for victory.

Space and time have been annihilated by modern methods of transportation.

Men returning to American shores think kindly of their allies in Britain, in Russia, in the countries of suppressed Europe, in Australia, in China, in India, in South and Central America, in Mexico and in the Dominion of Canada. Thus an international amity among millions of citizens as well as among the heads of nations is being created, which, it is hoped, may grow as an influence for peace as well as a barrier against war.

Ten years ago in the historic city of Geneva, Switzerland, the International College of Surgeons was founded. In a world then in peace, the founders of that organization visualized the day when the tranquility of nations might be precipitated into the chaos of war, when trained surgeons would be needed both at home and with the military forces. When the war came, with its demands for surgeons, the College was well entrenched, with members and chapters throughout the world. Members of the College both in the United States and in other countries have held positions of responsibility and leadership in the medical services of the armed forces.

The International College of Surgeons is a teaching organization. It is global in scope and influence. It is not in competition with any existing organization or society of surgeons; rather it would reach out the hand of scientific fellowship to surgeons all over the world and to national surgical organizations, and bid them join in the greater international march of industry, commerce, the arts, transportation, law, and alliances for world peace. For nearly a century surgeons everywhere have striven for a common goal in the restoration of nor-

mal physiologic functions of mankind. Now more than ever there is opportunity for scientific exchange of ideas and methods of elective procedure. The surgeons returning home from the war fronts of the world have mingled with professional confrères of other lands, have admired them, have been inspired by their work and have a strong desire to keep an international relationship with them. This is as it should be.

This is a golden opportunity for the International College of Surgeons to carry the torch of science and friendship throughout the world; to cement the gains thus far realized and continue to the full realization of the ideals of its founders.

It is perhaps not extravagant to hope that within two or three decades the majority of qualified surgeons who can meet the requirements of the International College of Surgeons will be enrolled under its banner of many flags, talking in many tongues but all speaking the common language of science with one purpose—a desire to maintain peace in the world and to alleviate suffering for all humanity.

HERBERT ACUFF,
President, United States Chapter,
International College of Surgeons.

CORRECTION

On page 366 of the July–August issue, the last paragraph of the review of Miriam Bredow's "Handbook for the Medical Secretary" should have been transposed downward, for it is really the introductory paragraph of the review of Louis J. Regan's "Medical Malpractice."

UNITED STATES MEMBERS DISCHARGED FROM MILITARY SERVICE

It will be greatly appreciated if members of the United States Chapter who have been in military service and are discharged will notify the Business Secretary promptly of their return to civilian status and send him a correct address.

NEW BOOKS

The importance of the use of autogenous bone for the purpose of stimulating osteogenesis and obtaining union in the treatment of fractures where healing is delayed or pseudarthrosis has occurred has been emphasized by many orthopedic surgeons. Technics have varied, and each qualified operator has developed his own preference for the onlay, inlay, osteoperiosteal or intramedullary graft. Methods of obtaining immobilization while the graft and the fracture were uniting have also varied widely.

In his **Bone Grafting in the Treatment of Fractures,**[1] **Armstrong** describes the methods which he himself has used with success. He emphasizes the importance of: (1) close and stable contact of large areas of bone on the graft and the host; (2) secure mechanical fixation of the graft and fracture; (3) removal of fibrous tissue and sclerotic bone from the fracture surfaces before grafting; (4) accurate apposition and alignment of fragments of the host bone; (5) restoration (as nearly as possible) of the architecture of the reconstructed bone at the conclusion of the operation to as near normal as possible.

Armstrong has preferred to use large full thickness onlay grafts, and in most of the cases illustrated he has maintained accurate apposition of the graft by means of metal screws. The technics described and illustrated are logical, and the principles outlined will be acceptable to most surgeons trained in the disciplines of bone and joint surgery. The illustrations are well selected and demonstrate both the methods and the results that can be obtained. This book will be of interest to all who treat old ununited or malunited fractures.

Few physicians realize the magnitude of the contributions of men of their profession to poetry. **Poet Physicians,**[2] compiled by **Mary Lou McDonough,** contains gems gleaned from the literature over a long span, from 750 A.D. to the present.

Most of the poetry is not unusual, being written mostly as an outlet for overstrained emotions, and as often as not during a "night watch" by the bedside of some patient. But along with the lighter verse one finds bits from Tobias Smollett, Oliver Goldsmith, Johann Schiller (friend of Goethe), John Keats, Oliver Wendell Holmes and Havelock Ellis, and the unforgettable "In Flanders' Fields" of John McCrae. In the lighter vein there are contributions from such contemporaries as Victor Robinson and Temple Fay.

The poetry of all the writers is characterized by the keen observation which one expects of men of science, and remarkably often by a humorous philosophy which one does not expect.

Nitrous Oxide–Oxygen Anesthesia,[3] by **F. W. Clement,** is an interesting and timely volume. The rapid strides in specialization and the progress in anesthesia make this book an important contribution. It is heartening to thumb through its pages and find deductions based on the physiology of respiration and research in this particular field.

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[1] Bone-Grafting in the Treatment of Fractures. J. R. Armstrong, M.D., M.Ch., F.R.C.S. A William Wood Book, The Williams and Wilkins Company, Baltimore, 1945. Price $7.00.

[2] Poet Physicians. An Anthology of Medical Poetry Written by Physicians. Compiled by Mary Lou McDonough. Charles C. Thomas, Springfield, Illinois, 1945.

[3] Nitrous Oxide–Oxygen Anesthesia: McKesson-Clement Viewpoint and Technique. Major F. W. Clement, M.C., A.U.S. Second edition, thoroughly revised. Lea & Febiger, Philadelphia, 1945.

The essential features of the book have not been altered in the second edition, except in a more profound study of the details. The concept of the physiology of nitrous oxide–oxygen anesthesia is dealt with in greater detail, and the technic of administration is exceptionally well presented. Above all, the guideposts and pitfalls associated with prolonged oxygen deficiency are aptly presented. One will find a description of the mechanism and treatment of shock, and of the role of carbon dioxide and of the sinoaortic areas in the compensatory reflex mechanism which protects the body in the presence of lowered oxygen intake. The fundamentals of this type of anesthesia have changed not at all. The admonition against persons who put patients to sleep without a thorough knowledge of physiology, pharmaceutics and chemistry as related to surgical anesthesia is timely. Such persons are a menace. They are merely technicians who induce sleep. Without knowledge of the fundamentals underlying the art and science of anesthesia, no one should be permitted to give an anesthetic except in dire emergencies.

Since an integration of anesthesiology is so important, this volume is warmly recommended to the student in surgery, to the intern, and particularly to the person who aspires to become an anesthetist.

Up to the present time too little attention has been given to the constitutional or genetic standpoint in both general and specialized practice of medicine, particularly in clinical endocrinology. **Constitution and Disease,**[4] by **Julius Bauer,** renowned clinical teacher in the field of applied constitutional pathology, familiarizes the reader with the principles of "constitutional thinking" at the patient's bedside and shows convincingly how much can be gained in diagnostic analysis as well as in therapy by interpreting clinical syndromes with a constitutional approach to biologic problems.

Constitution is not a physical entity, but a panel and plan of the total set-up of the individual personality. Exogenous factors should not be overlooked. In fact, the interaction between the individual and the environment is continuous from the germinal beginning to the end of life, and it is mutual; each affects and modifies the other. Especially in nervous disorders, endocrine diseases, allergic conditions, metabolic disturbances and diseases of the hemopoietic system, but also in essential hypertension, arthritism, peptic ulcer and cancer, biologic inferiority of the respective organ system may act as the determining factor for the development of the actual disease.

In calling attention to the intricate organization of the human individual and the fine mechanism of regulation, exercised mainly by the integrative functions of the endocrine and the nervous system, the author teaches physicians to be modest and more reluctant to interfere with the precise working of the living machine without necessity. In respecting the individual constitution and reaction one will avoid many pitfalls and errors in therapy.

The book fulfils what the author had in mind: to stimulate medical thinking and critical sense in evaluating old and new, actual and apparent facts in medicine. And it contributes to the ultimate aim of medicine: to cure sometimes, to relieve often and to comfort always.

Although the war is over, and the personal experience of the authors goes back to World War I, **Strecker and Appel's Psychiatry in Modern Warfare** [5] is well worth reading because of its intelligent approach to the essential psychiatric problems and its frank criticism of shortcomings in dealing with these problems. Psychiatry in general has kept too aloof from edu-

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[4] Constitution and Disease. Julius Bauer. Second edition. Pp. 247. Grune and Stratton, New York, 1945. Price $4.00.

[5] Psychiatry in Modern Warfare. By Edward A. Strecker and Kenneth E. Appel. Pp. 88. The Macmillan Company, New York, 1945. Price $1.50.

cation. Psychiatrists have shown a lamentable lack of interest in social psychiatry and sociology. "Many generations will have to pay for the huge neuropsychiatric morbidity rate of this war, if not in blood, certainly in sweat, tears and money. Complacency, apathy, isolationistic psychology have contributed. Psychiatrists and the military were not alone responsible. Unfortunately they reflected the temper of the people instead of assuming leadership."

Neuropsychiatric battle casualties in World War I were of the proportion of 1 to 7 of the total; in World War II, 1 to 3, or roughly 30 per cent. In World War I the common neurosis was conversion hysteria. In World War II the preponderant psychoneuroses are anxiety reactions. Effort syndromes have decreased, while gastrointestinal disorders have increased. The present war, which was fought in the stratosphere, in the depths of the sea, in the arctic wastes and in the tropical jungles, with war machines of unprecedented destructive power, of tremendous speed and without any zones of security even in the rear, demanded constant vigilance without relaxation, and accounted for greater tension, unrelievable anticipation and increased fear.

There seems to be a better preparedness with regard to the psychologic readjustment problems of the returning soldier, and here the authors give valuable contributions to the understanding of the returnee and practical suggestions for an attempt to adjust him emotionally, socially, occupationally, culturally and spiritually. It should be borne in mind that the vast majority of military neuropsychiatric diagnoses do not signify an incapacity to become an effective worker and a social success.

The well known author **Arthur Weil,** in his **Textbook of Neuropathology,**[6] presents an excellent review of the present stage of our knowledge in neuropathology, and by his critical discussion of the many unsolved problems with regard to the etiology of nervous diseases he gives a valuable contribution to its clarification. Since neuropathology is no longer merely histopathology, and the microscope is no longer the only tool at one's disposal for study of disease processes, the newest chemical and physiologic data are taken into account, and the results of the investigation of vitamin deficiencies and of the study of the different shock treatments as well as the experiences with virus infection and experimental tumor production are incorporated.

Especially instructive is the chapter about tumors. His classification of brain tumors allows a better understanding of this subject, with its generally confusing nomenclature. As far as the different conflicting theories regarding tumor growth are concerned, the author's own experimental studies with implantation of chemical substances in animal brains give strong support to the chemical and toxic theory. "Each cell is potentially neoplastic and forms its adequate tumor under the stimulating influence of the proper chemical substance."

Two hundred and eighty-seven illustrations and an appendix describing a standard necropsy and the best staining methods enhance the didactic value of the book.

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[6] Textbook of Neuropathology. Arthur Weil. Second edition. Pp. 356. Grune and Stratton, New York, 1945. Price $5.50.

NEWS AND ANNOUNCEMENTS

GENERAL

Pan-American Congress of Ophthalmology.—The Second Pan-American Congress of Ophthalmology will be held in Montevideo, Uruguay, Nov. 26 to Dec. 1, 1945. Meetings will be held in the Municipal Hotel Miramar on Carrasco Beach.

Pan-American Congress of Otolaryngology Postponed.—The Pan-American Congress of Otolaryngology and Broncho-Esophagology has been postponed until the year 1946. The American Academy of Ophthalmology and Otolaryngology is preparing a directory of otorhinolaryngologists in the Americas, which will include the names and addresses of the qualified specialists in the various countries of North, Central and South America and also a list of the societies of otorhinalaryngology, with their present officers, the journals of this specialty, with their editors in chief, and the faculties of medicine which have chairs of otorhinolaryngology, with the names of the present incumbents.

Latin American Physicians Assist in UNRRA Program.—Eight physicians from Colombia and five from Venezuela have come to UNRRA to work on its program of medical and health assistance in the liberated areas of Europe. The doctors went to the UNRRA training center at the University of Maryland for a two week orientation course before leaving for overseas. From Colombia are Drs. Hector Acevedo, Bogota; Gustavo Gomez-Hurtado, Bogota; Alfonso Gomez, Bogota; Jorge Jimenez, Bogota; Ganzalo Montes, Bogota; Gerardo Paz, Popayan; Carlos Quintero Hernandez, Barranquilla, and Alvaro Ujueta, Bogota. From Venezuela are Drs. Imelda Campo, Caracas; Victor Estaba Acuna, Caracas; Juan Alberto Gambus, Maiquetia; Francisco Emilio Rodriguez, Barquisimeto, and Claudio G. Vargas Mendoza, Tovar Estado Merida. The Colombians and Venezuelans are the fourth group of doctors to come to UNRRA for European service. Nine Cuban doctors have left for overseas, eleven Mexican doctors are now at the training center and Brazil is sending a group directly to Reading, England. The doctors will be part of the 450 teams working at displaced persons assembly centers.

Sir Alexander Fleming Honored in France.—Sir Alexander Fleming, the discoverer of penicillin, has been made a Commander of the Legion of Honor in Paris, France.

Pan-American League for Study and Control of Rheumatic Diseases.—The Pan-American League for the Study and Control of Rheumatic Diseases was recently established. Representatives include Argentina, Brazil, Canada, Chile, Mexico, Paraguay, Peru, Uruguay and the United States. The officers are as follows: president, Dr. Ralph Pemberton, Philadelphia, Pa., U. S. A.; vice president, Dr. Anibal Ruiz-Moreno, Buenos Aires, Argentina; secretary, Dr. Loring T. Swaim, Boston, Mass., U. S. A.; treasurer, Dr. Fernando Herrera Ramos, Montevideo, Uruguay. The objectives of the league are to strengthen cultural bonds between the countries, to further efforts to alleviate suffering from rheumatic diseases and institute preventive measures, to compile and disseminate knowledge and information regarding rheumatism in the respective countries, to unify the nomenclature and classification, to promote scientific investigation and to hold pan-American congresses on the rheumatic diseases.

Dr. Daniel B. Kirby of United States Gives Course in Operative Technic in Mexico.—The Mexican Ophthalmological Society and the University of Mexico sponsored a one week course in operative technic by Dr. Daniel B. Kirby. The course consisted of lectures and demonstration of operations for cataract, glaucoma, ptosis, strabismus and other ocular conditions. In recognition of Dr. Kirby's teaching work the University of Mexico appointed him Extraordinary Professor of Ophthalmology.

Dr. Zavalia (of Argentina) in United States.—Dr. Alberto Urrets Zavalia, Professor of Ophthalmology at the University of

Cordoba, Argentina, has paid a visit to hospitals and clinics in the United States. He visited Dr. Kronfeld's clinic in Chicago and the Eye Clinic at the Medical Center in New York.

British and French Offer Graduate Courses to Medical Army Officers.*—In the first three months of a program of medical and surgical retraining for civilian practice, more than 300 army medical officers have attended six of the leading medical schools in England and France since June. In addition many officers have been placed by the Information and Education Division in Europe and the Office of the Chief Surgeon in numerous hospitals and clinics to observe British and French methods.

One of the English schools selected by the Office of the Chief Surgeon for a continuous program of observation and study is the British Post-Graduate Medical School of the University of London. At the Post-Graduate School medical officers take a six week course in which they attend classes conducted by leading physicians and surgeons of England, make ward rounds as observers and observe in the clinics and operating theater.

At the Hammersmith Hospital, which is cooperating with the University of London, classes are held by the Post-Graduate School in pathology, in general surgery and in obstetrics and gynecology. Two other hospitals in London are used by medical officers at the school, although they are not regularly used by the University of London. These hospitals are the Chelsea Hospital for Women and Queen Charlotte's Maternity Hospital.

There are courses in neurology at the National Hospital for Nervous Diseases, London, in psychiatry at the York Clinic of Guy's Hospital, London, and at the Sutton Emergency Hospital, Sutton, Surrey, and in orthopedics at Queen Mary's Hospital, London.

Courses are being conducted at Oxford University, the Royal Army Medical College and Liverpool University Medical School, while other courses will be offered at other times in additional schools.

In France the Information and Education Division placed thirty-five medical officers the Faculté de Médecine of the University of Paris as observers in clinical research, diagnosis and surgery in eight hospitals in the Paris area. Hospitals being used for these studies in neurology, psychiatry, gynecology and obstetrics are the Clinique Baudeloque, Hôpital Broca, Hôpital de la Pitié, Asile Sante-Anne, Hospice de la Salpêtrière, Clinique Tarnier, Hôpital de Vaugirard and La Maternité.

Dr. Zamora (Bolivia) in St. Louis.—Dr. Mario Michel Zamora, of Bolivia, is now working under Dr. Roland Klemme in St. Louis, under the plan of the International College of Surgeons whereby younger surgeons are enabled to study and gain experience with men established in their special fields.

French Radiologists Request Reprints.—Radiologists in France will appreciate it if radiologists in the United States will send them reprints of articles published since 1939 on radiology (diagnostic), roentgen therapy, radium therapy and neutron therapy, electrology and cancerology. The appeal was sent to Dr. Ursus V. Portmann, Cleveland, Ohio, by Dr. Robert Coliez, president of the Hospital Radiologists of Paris. Reprints should be sent to Dr. Coliez at 25 Rue Franklin, Paris, xvième, France.

DENMARK AND NORWAY

Status of Science in Denmark and Norway.—A recent visit of a representative of the Royal Society of London, England, to Denmark and Norway revealed the following conditions, as reported in *The Times* (London): *

"Science in Denmark has not suffered as badly as in most countries occupied by the Germans. Until the autumn of 1943 the invaders were on their best behavior, but at that time the *Gestapo* became active and students ceased to attend the colleges. Professor Rehberg, the zoologist, was brutally mishandled by the Germans for lack of cooperation, and he and a good many other men of science were imprisoned, but escaped when the prison was very skillfully bombed by us. Research, however, continued in the laboratories which were not despoiled, and much excellent work has been published in the *Proceedings* of the academy.

"Food is in good supply and the generous Danes have done and are doing sterling work

* From Medicine and the War, J.A.M.A. **129**:248 (Sept. 15) 1945.

* Quoted from Science **102**:170, 1945.

in collecting food for Norway and Holland. Their chief scientific need is books and journals, and English text-books for students. To show how quickly the Danes have been able to establish themselves, they are contemplating an expedition next year for marine biological investigation, a subject in which they have high traditions, off the west coast of Africa. They already have a ship and funds. They trust that our authorities will facilitate the work, in which they will gladly welcome the aid of the British biologists.

"Norway has suffered much more than Denmark. The president of the academy, Professor Bull, was three years in a concentration camp: the scientific laboratories have been stripped of apparatus and the departments closed. In consequence, little scientific work has been carried out during the war and the Norwegians are having great difficulty in getting their courses started again. Medicine in Norway attained, before the war, a very high standard, and it is most desirable that medical instruction should get under way as soon as possible. The Danes are taking a large number of Norwegian medical students, and Norway is anxious that some of her best post-graduate students should study in England. These men are ready to come now and there are very real reasons why we should help. Norway's geologists are anxious to serve for a period in our surveys abroad and her oceanographers and biologists would gladly take part in our expeditions."

ARGENTINA

Dental Care for Children Obligatory.—Dental care for children of school age and adolescence is obligatory in Argentina. On entering school children have a dental examination, the results of which are recorded and kept on file. The examinations are repeated periodically. The parents are notified when the children require dental care, which can be given by the family dentist or free in the dental national centers. Parents who break the law are fined. Teachers may be penalized with a fine. Repeated infraction is punished with temporary closure of the school if private or with discharge of the teacher if the school is operated by the government.

Report of Treatments for Cancer Required.—A law was recently passed requiring that all reports of the use of drugs or treatments for curing cancer should be made to the National Department of Public Health before being published. The law was based on the harm which may result to laymen from neglecting cancer while taking a useless treatment. The authorities of public health all through the country have given radio lectures discussing the scientific treatment of cancer and advising people to stay away from charlatans.

ENGLAND

Pen Picture of New Fellow, Alfred George Timbrell Fisher, M.C.Mb., Ch.B., F.R.C.S. (Eng.), F.I.C.S.—Alfred George Timbrell Fisher was born in 1888. He received his medical education at Bristol University and St. Bartholomew's Hospital, London. His early appointments were as senior house surgeon and surgical registrar, Bristol General Hospital, and as chief demonstrator of anatomy and lecturer on surgical anatomy at the University of Bristol.

During World War I he was a major in the Royal Army Medical Corps and surgical specialist and was with a field ambulance for a time. He was awarded the Military Cross in the field for "conspicuous gallantry and devotion to duty."

After the war Mr. Fisher went to London and was appointed assistant Surgeon to the Dreadnought Hospital, lecturer and demonstrator on operative surgery to the London School of Clinical Medicine, Assistant to the Surgical Unit at University College Hospital, surgical specialist to the Ministry of Pensions and assistant in the orthopedic department of St. Bartholomew's Hospital.

During this period and in the subsequent years Mr. Fisher engaged in considerable original research, partly in collaboration with the Medical Research Council. The principal subjects of this research have been: (1) osteoarthritis and other diseases of joints; (2) physiology of joints, including structure and functions of articular cartilage and synovial membrane; (3) loose bodies in joints; (4) internal derangements of the knee and other joints. He has endeavored (successfully he hopes) to place the subject of manipulative surgery on a scientific basis.

Mr. Fisher was the first to hold the high honor of being Hunterian Professor of the Royal College of Surgeons of England in successive years, and was also the youngest man to be so appointed. He has lectured all over the world on the subjects of his research and

has devised new methods of approach to the knee joint, which receive notice in most textbooks on operative surgery and are performed by surgeons all over the world.

He has written three standard monographs, one of which has reached a fourth edition and has had a large sale in the United States as well as in England.

Mr. Fisher now practices almost exclusively in orthopedics. He is senior trustee of the Empire Rheumatism Council. He is also a founder member of the Executive and Scientific Committees of the Council and assisted Lord Horder, the chairman, in drawing up the Plan for National Action in Connection with Rheumatism. He is chairman of the Nomenclature Committee of the Royal College of Physicians' Committee on Rheumatic Diseases. He is on the active staff of various hospitals; these appointments include acting as orthopedic surgeon to the Order of St. John Clinic for Rheumatism and Other Diseases and to the pioneer Rheumatism Unit of the L.C.C. at St. Stephen's Hospital, London.

He is a Commander of the Order of St. John of Jerusalem, a corresponding member of the American Academy of Orthopaedic Surgeons, a Fellow of the Royal Society of Medicine and a member of the British Orthopaedic Association. During the recent war he has continued these activities and has also worked as orthopedic surgeon in the government's emergency medical service.

British Medical Association Passes 50,000 Mark.—For the first time in its history, the membership of the British Medical Association has exceeded 50,000. On Sept. 2, 1939, the number was 39,121; in 1942, 41,239, and in July 1945, 50,032. The great increase in these three years seems * to have been due to the Beveridge scheme for a national health service, which threatened to convert physicians into state officials.

BRAZIL

Benedito Montenegro, Pioneer in Gastric Surgery.—In commemoration of the twentieth anniversary of the first performance of partial gastroduodenectomy by Prof. Benedito Montenegro, his friends and colleagues published a special number of the *Revista de Cirurgía de São Paulo.*

* Letter from London correspondent, J.A.M.A. 129:225 (Sept. 15) 1945.

SYRIA

News from Dr. Altoonyan.—News has been received from Dr. Altoonyan, of Aleppo, Syria. Since his son left for military service, in 1940, Dr. Altoonyan has carried on the work of his hospital alone except for the help of a young Armenian assistant.

U. S. S. R.

Nicolai Burdenko Elected President of Soviet Academy of Medical Sciences.—Dr. Nicolai N. Burdenko has been elected President of the Academy of Medical Sciences. During the war Dr. Burdenko performed many complicated neurosurgical and pulmonary operations at the front, as chief surgeon of the Soviet Army. He is founder and director of the Institute of Neurosurgery, head of the department of neurosurgery at the Post-Graduate Institute for Physicians, chairman of the Learned Council of the People's Commissariat of Health, member of the Extraordinary State Commission for Investigating German Crimes and member of the U.S.S.R. Academy of Sciences.

Centenary of Ilya Mechnikov's Birth.—On May 15 was celebrated the centenary of Ilya Mechnikov's birth. His contributions in the field of comparative embryology of invertebrates are well known. A monument was erected in his honor, and a gold medal with his name is to be awarded every three years for the best studies in microbiology.

UNITED STATES

Meeting of Hudson Valley Guild.—The Hudson Valley Guild of the United States Chapter of the International College of Surgeons met in St. Francis' Hospital, Poughkeepsie, N. Y., on October 1. Dr. A. A. Berg, international president elect of the College, was the guest speaker. Before his scientific address, on "Ulcerative Colitis," Dr. Berg spoke of the aims and work of the College. He emphasized the need for international sharing of knowledge and pointed out that the surgeons of the future should be diagnosticians as well as competent in surgical technic. Dr. Max M. Simon, of Poughkeepsie, is president of the Hudson Valley Guild.

Educational Program to Commemorate Anniversary of Discovery of X-Rays.—

Nov. 8, 1945 marks the fiftieth anniversary of the discovery of roentgen rays. The American College of Radiology will sponsor a nation-wide educational program during the week of Nov. 5 to 10, 1945, to familiarize the public with the importance of radiology to everyday health and to increase the public's understanding of the medical specialty of radiology.

New Medical Journals.—A quarterly journal is to be published by the Gerontological Society, Inc. The editor in chief is Dr. Robert A. Moore, Washington University School of Medicine, St. Louis, Mo., and the first number will appear in the first quarter of 1946. The publisher is Charles C. Thomas, Springfield, Ill. The journal will contain articles on variout aspects of the problems of aging and the care of the aged.

Another new journal recently announced is *Blood: The Journal of Hematology,* to be published by Grune and Stratton, New York. Dr. William Dameshek, Boston, Mass., will act as editor in chief, and well known hematologists are listed as associate, consulting and assistant editors.

Anti-Vivisection Society Not Legally a Charity.—The National Anti-Vivisection Society claimed exemption from income tax on the ground that it was a body established for charitable purposes only. Mr. Justice Macnaghten decided to the contrary, since the main object of the society is the total abolition of vivisection and it has been proved that discontinuance of experimentation on living animals would constitute a serious obstacle to the securing of medical knowledge.

Lt.-Col. Charles Arnold Back in United States.—Lt.-Col. Charles Arnold, Secretary of the United States Chapter of the International College of Surgeons, has returned to the United States. After his discharge from the Army, he and Mrs. Arnold expect to spend three or four months in the West.

Six Projects for Improvement of Artificial Limbs.—An intensified program for the improvement of artificial limbs which involves six separate projects will be undertaken by the Army in coordination with the National Research Council, according to an announcement by Major General Norman T. Kirk, Surgeon General of the Army.

In February 1945 the National Research Council through its Committee on Prosthetic Devices, which comprises some of the country's outstanding scientists, started work on the problem of providing better arms and legs for amputees. Cooperating with this committee are the Veterans Administration, Navy, Army, National Bureau of Standards, Federal Security Agency and engineers from some of the nation's top industrial concerns.

The research activities of the Committee on Prosthetic Devices will continue along the same lines, but the Army will give further cooperation in certain additional phases of the program. The plan of Army scientists is to complement what is being carried on under the National Research Council auspices.

The Army will conduct its research work at Army General Hospitals which are amputation centers. The presence in these hospitals of orthopedic surgeons who are handling these amputation cases and the clinical evaluation possible under such circumstances is expected to prove of definite value.

The aim of both projects is the general improvement in the quality of artificial limbs, more standardization of parts and the facilitation of production and fitting.

The six phases of the program in which the Army will devote its efforts include: (1) further development and improvement of knee assembly and ankle assembly; (2) investigation of materials for producing a cosmetic hand or for covering a mechanical hand; (3) evaluation of usefulness of plastics in sockets or limb sections; (4) broad study of metals and alloys used in fabrication of artificial limbs; (5) investigation of fabrics and techniques of manufacture and fitting for protheses at or below the ankle; (6) production of a motion picture record of the Army amputation and prosthetic program.

Private industry will play an important part in this program. The Committee on Prosthetic Devices of the National Research Council contracts with individual concerns for basic research, which is carried on in the laboratories of the company contracted.

The government authorizes payment for all expenses under these contracts, and the Army through its amputation centers will afford every possible means of cooperation. An appropriation has been authorized sufficient to continue this Army project as long as The Surgeon General expects to have amputee

(Continued on page 487)

TECHNICAL EXHIBITS

TENTH NATIONAL ASSEMBLY
of the
UNITED STATES CHAPTER
of the
INTERNATIONAL COLLEGE OF SURGEONS
Chinese Room
Mayflower Hotel
Washington, D. C., December 6 at 1 P.M. and 7–8, 1945

The latest in pharmaceuticals, surgical apparatus and instruments, medical books and products of special interest to surgeons will be on display.

Members and visitors are urged to study these exhibits during recess periods, which will be arranged at frequent and appropriate intervals.

Following are the names of the firms exhibiting and descriptive items.

BARD-PARKER COMPANY, INC.

Danbury, Conn.
Booth 1

The following products will be exhibited: Rib-Back Surgical Blades, Long Knife Handles for deep surgery, Renewable Edge Scissors, Formaldehyde Germicide and Instrument Containers, Transfer Forceps, Hematological Case for obtaining bedside blood samples.

AMERICAN STERILIZER COMPANY

Erie, Pa.
Booths 2 and 3

Demonstrations with a live model will be given on the Albee-Comper Fracture Table devised by Dr. Fred H. Albee. Optional accessories will also be demonstrated during the meeting to show that maximum operative efficiency is obtained with a minimum of surgical time and fatigue.

Demonstrations of our 1075 Major Surgical Operating Table will also be given.

CAMERON SURGICAL SPECIALTY COMPANY

Chicago, Ill.—New York, N. Y.
Booth 4

The Cameron Surgical Specialty Company will show the new Broncho-Esophago-Laryngoscopic Set, the new Cavi-camera for photographing in color through gastroscopes and cystoscopes, New Boilolite Transilluminators, Photo-Microlite and Projector. There will also be exhibited the Omniangle Flexible Gastroscope, Binocular Prism Loupe, Mirrolite (the new Headlite), Magniscope, Electro-Surgical Units. Walton P. Smith, Eastern Manager, in charge. Eastern Office 250 West 57th Street, New York, N. Y.

THE TECHNICON COMPANY

New York, N. Y.
Booth 5

The Technicon Company will display two instruments of unique interest . . . the AUTOTECHNICON and the SCOPICON.

The Autotechnicon is a machine for automatically processing and staining tissues in preparation for pathologic diagnosis. Remarkable reductions in the time heretofore required for microscopic examinations make obsolete previous hand methods. When it is used for this work, the surgeon may expect a pathologic diagnosis routinely within twenty-four hours.

The Scopicon is a device for the magnification projection of the microscopic images of slides and similar material for simultaneous direct study by as many as ten observers. . . . The projected image may also be cast upon a screen with full detail, achieving great magnifications. The spectacular performance of the Scopicon is due not only to a brilliantly designed optical system, but also to the employment of a very high intensity light source, a pressure mercury vapor lamp which delivers a beam of lumens higher than any other projection lamp yet devised. Under such efficient cooling conditions, the slides or microscope are not harmfully effected. Such magnifications as are projected through the oil immersion lens of the microscope come out clearly and intensely. Provision is also made on the machine for the incorporation of a camera for lantern slides or Kodachrome transparencies.

Both machines—the Autotechnicon and the Scopicon—will be in actual operation at all times during the meeting.

MACALASTER BICKNELL COMPANY

Cambridge, Mass.
Booth 5A

Presenting the FENWAL SYSTEM for intravenous fluids, or blood and plasma, and featuring the new POUROVAC seal, a practical vacuum closure for solutions, the sterility of which, during long storage periods, may be constantly determined without breaking the seal. Eliminates waste of unused or out-dated solutions. Serves a secondary purpose of providing a dust proof seal for remaining fluid when only partial contents of a container is required.

THE ALKALOL COMPANY

Taunton, Mass.
Booths 6 and 7

Showing Alkalol, claimed by the manufacturer to be a carefully balanced alkaline saline solution. It is aqueous, containing no glycerine and only a trace of alcohol, dissolving mucus, bland, nontoxic, nonirritating. It is suggested for mucous membranes and irritated tissues and is a comforting, effective wet dressing used postoperatively.

Also Irrigol, an alkaline, saline, slightly astringent powder, readily dissolved in water, recommended as a safe, cleansing vaginal douche, etc. In charge: J. P. Whitters, Jr., W. J. Ford and E. W. LeClair.

THE TOWER COMPANY, INC.

Seattle, Wash.
Booth 8

The Tower Company, Inc., is demonstrating the new Roger Anderson Fracture Table designed for orthopedic and general surgical work. This light but strong aluminum table provides for all fracture, orthopedic and surgical procedures: hip-nailing, skeletal and other types of traction, including vertical, transverse and longitudinal spinal traction, hyperextension of the spine, and application of all casts. The addition of a mattress converts it into a general surgical table. It is outstand-

ing for its simplicity of operation, ease of maneuverability, compactness and completeness. Also on display are the 1946 model Axial-aligning Fracture Reduction Splint and a complete line of skeletal fixation equipment for all types of fractures. General items of interest are the new Clavicle Suspension Splint, Hip-nailing Equipment, Henry Jordan Arm Splint, Charles Bradford Cassette Holder, and new Smedberg Bone Drill.

THE WM. MEYER CO.

Chicago, Ill.

Booths 9 and 10

In its initial exhibit at the Tenth National Assembly, these forty-one year old manufacturers of medical and dental x-ray equipment will feature their exclusive Head and Specialty X-Ray Unit, which obtains standardized views of the head with the patient in a convenient sitting position. Other office and portable x-ray equipment will be included.

J. R. SIEBRANDT MFG. COMPANY

Kansas City, Mo.

Booths 11 and 12

The new Clayton Transfixion Splints are now offered to the medical profession by Siebrandt. These splints are the results of years of experimental research and development in collaboration with a well known orthopedic surgeon.

They have many advantages over other type transfixion splints. Built of plastic, transparent to x-ray—simple in construction and extremely light in weight and have no complicated mechanism to adjust; they eliminate plaster cast and reduce cost and time of treatment. The exhibit will also include a complete line of bone instruments and fracture equipment, including the Davison Director for hip nailing and the Goodwin Bone Clamp, which simplifies the technic for open reduction when wiring long bone fractures, also a new type Portable Combination Fracture Table with X-Ray tunnel.

THE TOWER COMPANY, INC.

Seattle, Wash.

Booth 13

The Tower Company, Inc., is exhibiting Aire-lite, the new glass plastic bandage for waterproof casts. This newly developed, clinically tested bandage is made from fine flexible strands of Fiberglass and cellulose acetate. After being immersed in the Aire-lite Setting Fluid the bandage is wrapped on smoothly and allowed to dry. The Fiberglass strands assure dimensional stability and great strength. It is the only cast that will admit light and air, is buoyant in water and is all plastic. The cast material is elastic and can be stretched as it is being applied, allowing for true conformation to the slightest deviation in contour. We cordially invite you to examine this material at first hand and to witness an actual demonstration.

F. A. DAVIS COMPANY

Philadelphia, Pa.

Booth 14

F. A. Davis Company has the privilege of presenting to the members of the International College of Surgeons and visiting surgeons two outstanding books: "Surgery of the Spinal Column" by the late Fred H. Albee, Ex-President of the International College of Surgeons, in collaboration with Earl J. Powers, M.D., and Lt. Col. Harold C. McDowell, M.C., A.U.S., and "The Face in Health and Disease" by Max Thorek, M.D., LL.D., D.SC., Editor in Chief of the Journal of the International College of Surgeons. Many other new books of special interest may be leisurely examined at our booth.

GUDEBROD BROS. SILK CO., INC.

New York, N. Y.

Booth 15

An exhibit consisting of surgical sutures of the non-absorbable type, by the manufacturers of Champion Silk Sutures, made of pure Asiatic raw silk in the twisted and braided type, untreated; also the Serum-Proof, or noncapillary, type in black and white, wound on spools and in ampules. Champion Silk dermal and tension sutures put up on cards and in ampules. Sutures produced from the new nylon fiber. Sutures produced with so-called Dr. Pagenstecher celluloid coating, and the newest suture—Handcraft cotton suture. Other items to be exhibited are the Umbilical Tapes, braided, in various widths, in the flat, round or cord types.

CAMERON HEARTOMETER COMPANY

Chicago, Ill.

Booth 16

The Cameron Heartometer Company is showing the improved Heartometer, a scientific precision instrument for accurately recording systolic and diastolic blood pressures. It also furnishes a permanent graphic record of the pulse rate, the nervous functioning of the heart and the myocardial response, as well as the functioning of the valves. The Heartometer clearly reveals heart disturbances in both early and advanced stages and is of great value in checking the progress of medication and treatments.

MEDICAL FILM GUILD

New York, N. Y.

Booths 17 and 18

Medical Film Guild emphasizes its talking papers in this year's program of "Medical Films That Teach." Hospital and Medical Society program chairmen who desire educational material for their meetings find that Medical Film Guild's motion picture film textbooks answer that important problem. Through grants for postgraduate instruction, these films are available at no charge to any hospital or medical society meeting and to the medical services connected with the Armed Forces of the United States. Exhibition is also included at no charge under this plan. Subjects available are: Inguinal Hernioplasty; Asphyxia Neonatorum; Nonoperative Treatment of Paranasal Sinusitis; Otitis Media in Pediatrics; A Clinic on Acute Mastoiditis; Otoscopy in the Inflammations; A Clinic on Sigmoid Sinus Thrombosis; A Clinic on Petrositis with Meningitis; Amebiasis and Its Treatment; A Clinic on Otitic Purulencies; Pharmacology of Respiratory Stimulants; Rehabilitation for Parkinson's Syndrome; Anatomy of the Ear.

ETHICON SUTURE LABORATORIES

(Division Johnson and Johnson)

New Brunswick, N. J.

Booth 19

Tantalum to Be Demonstrated. Surgical sutures made of the rare metal tantalum will be shown to surgeons who visit the Ethican Suture Laboratories' exhibit. Other new special purpose sutures, shown with suaged needles, include those for eye, nerve and gastrointestinal surgery, as well as stay sutures and nylon and silk in fine gauges. Of special interest to urologists, gynecologists and orthopedic surgeons, as well as to general surgeons, will be the tubes of sterile fascia lata in strips and in sheets.

CIBA PHARMACEUTICAL PRODUCTS INC.

Summit, N. J.

Booth 20

Visitors are cordially invited to our exhibit, where a representative will answer questions regarding Ciba specialties, and discuss in detail those particularly applicable to the fields of surgery—*CORAMINE*, circulatory and respiratory stimulant; *NUPERCAINE*, local and spinal anesthetic of prolonged action; and *TRANSENTINE*, effective antispasmodic.

SHARP & DOHME, INC.

Philadelphia, Pa.

Booth 21

Sharp & Dohme will have their display at Booth 21, featuring Tyrothricin Concentrate for human use, 'Lyovac" Normal Human Plasma, Sulfamerazine, "Sulfasuxidine", "Caligesic" Ointment, a greaseless, anesthetic and analgesic ointment which possesses specific anti pruritic action, and "Prothricin", a new antibiotic nasal decongestant. A cordial welcome awaits all visitors.

SCHERING CORPORATION
Bloomfield, N. J.
Booth 22

Schering Corporation, in line with their policy of bringing out the latest in endocrine research, is featuring the new estrogenic product—ESTINYL Tablets.

ESTINYL, a derivative of the natural hormone alpha-estradiol, is most economical and is orally effective in dosage of 0.02 and 0.05 mg. It produces very little nausea and toxic side effects.

Other Schering preparations on display will be Oreton-F Pellets, ORETON, ORETON-M Tablets, PROGYNON-B, PRANONE, PROLUTON and CORTATE, and the diagnostic products for x-ray examinations—NEO-IOPAX and PRIODAX.

WHITE LABORATORIES
Newark, N. J.
Booth 23

White Laboratories, Inc., present information regarding White's Sulfathiazole Gum—expressly formulated for topical chemotherapy of oropharyngeal infections.

White's Otomide, a new and more effective means of topical chemotherapy of infections of the ear, is offered for discussion.

White's ethically promoted vitamin specialties are also featured.

ZIMMER MANUFACTURING CO.
Warsaw, Ind.
Booth 24

Zimmer Manufacturing Company will have on display in Booth 24 a full line of Fracture Equipment. All surgeons are especially invited to inspect the new bone instruments on display, including the Two-Speed Hand Drill and Screw Driver; also the improved Bone Clamps, Key Dual Bone Plate Outfit, Blount Knee Retractor, Waugh Clamps, Crego-McCarroll Traction Bow, Webb Bolt Fixation Set, McBride Tripod-Pin Traction Apparatus, Curry Hip Nail Reamer, Plaster Saw and Bush Walking Heel.

MEAD JOHNSON & COMPANY
Evansville, Ind.
Booth 25

"Servamus Fidem" means We Are Keeping the Faith. Almost every physician thinks of Mead Johnson & Company as the maker of Dextri-Maltose, Pablum, Oleum Percomorphum, and other infant diet materials—including the new precooked oatmeal cereal, Pabena. But not all physicians in other countries are aware of the many helpful services this progressive Company offers physicians. A visit to Booth No. 25 will be time well spent.

DOHO CHEMICAL COMPANY
New York, N. Y.
Pan American Room

FREDERICK STEARNS & CO.
Detroit, Mich.
Booth 26

Products of interest.

J. B. LIPPINCOTT COMPANY
Philadelphia, Pa.
Grand Ballroom Promenade

Presenting a complete list of Lippincott Selected Professional Books, including Dr. Max Thorek's Modern Surgical Technic and Surgical Errors and Safeguards. New books of significant interest: Bancroft-Murray, Surgical Treatment of the Motor Skeletal System; Thomas and Haddan, Amputation Prosthesis; Groff and Houtz, Manual of Diagnosis and Management of Peripheral Nerve Injuries. Advance information on many other new books in active preparation.

LEA & FEBIGER
Philadelphia, Pa.
Grand Ballroom Promenade

In the grand ballroom promenade of the Mayflower Hotel, Lea & Febiger will exhibit among their new works Babcock's Principles and Practice of Surgery, Donaldson's Surgical Disorders of the Chest, Lewin on Backache and Sciatic Neuritis, Burch and Winsor's Primer of Electrocardiography and Olkon's Essentials of Neuro-psychiatry. New editions will be shown of Spaeth's Ophthalmic Surgery, Comroe on Arthritis and Allied Conditions, Boyd's Pathology of Internal Diseases, Ivy and Curtis' Fractures of the Jaws, Clement's Nitrous Oxide-oxygen Anesthesia, Kuntz' Autonomic Nervous System, Kuntz' Textbook of Neuro-anatomy, Kovacs' Electrotherapy and Light Therapy, Gray's Anatomy and other standard works.

JOURNAL OF INTERNATIONAL COLLEGE OF SURGEONS
Chicago, Ill.
Grand Ballroom Promenade

The *Journal* of the International College of Surgeons will be distributed. Information regarding exhibits may be secured here. Visiting surgeons are invited to leave their cards if they wish to have the *Journal* or information concerning the *Journal* mailed to them.

J. H. EMERSON COMPANY
Cambridge, Mass.
Pan American Room

Resuscitation and hospital equipment. Represented by William H. Stephenson.

NEWS AND ANNOUNCEMENTS

(Continued from page 484)

cases in Army General Hospitals. There have been about 14,000 amputees in Army General Hospitals in this country since the beginning of this war. Of this total there are now about 8,300 amputees who are in the six amputation centers in Army General Hospitals.

Five per cent of these patients are battle veterans who have two arms or legs or one arm and one leg; 9 are triple amputees and only 2 men have lost both hands and both feet. Approximately 95 per cent are men who have suffered the loss of only one limb.

Sección en Español

Anestesia Local

Algunos detalles indispensables para su éxito

DR. MARIO GONZÁLEZ ULLOA
MÉXICO, D. F., MÉXICO

HASTA finales del año de 1941 hemos registrado 1,047 intervenciones quirúrgicas entre las que quedan comprendidas desde la extirpación de una pequeña cicatriz hasta la restauración de media cara o la corrección de una mastoptosis. De las mencionadas intervenciones, 867 (82 por ciento) han sido hechas con anestesia local: es sobre la experiencia adquirida en esos casos, de lo que trata la presente nota.

En todos los casos sa he utilizado el clorhidrato de procaína como agente anestésico local; de una manera sistemática la concentración de la misma es actualmente: para la cara, al 2 por ciento; para pequeñas intervenciones en el tronco o miembros, al 1 por ciento, y para intervenciones en grandes áreas en el tronco, al 0.75 por ciento.

La nutrida red nerviosa vascular de la cara origina un gasto anestésico de consideración; las soluciones al 1 por ciento nos daban analgesia irregular y de poca duración, en vista de lo cual iniciamos el uso de una solución al 2 por ciento; la analgesia, en impregnación y duración, fué satisfactoria en la mayoría de los casos, salvo en algunos, en que por la larga duración de la intervención se originó el completo desgaste de la analgesia; para esos casos llegamos a usar una solución al 3 por ciento; la insensibilidad se conservaba en aproximadamente 25 por ciento más de tiempo, pero observamos grandes molestias post-anestésicas que obligaron a suspender la concentración citada y continuar el uso de la solución al 2 por ciento.

En el tronco las ramificaciones nerviosas son menos compactas; al principio utilizábamos en las operaciones en áreas extensas (v.gr.: en la operación de la mastopexia) las soluciones al 1.50 o 1 por ciento, pero la cantidad de líquido que era preciso inyectar para impregnar toda la extensa área operatoria era tan grande (de 300 a 500 cc.) que comenzámos a bajar las concentraciones desde 1.5 por ciento hasta 0.5 por ciento; esta última era irregular y de poca duración; en cambio la de 0.75 por ciento nos ha dado un resultado satisfactorio, y por ello hemos continuado regularmente su uso.

En 841 casos (97 por ciento de esta serie) hemos añadido adrenalina a la solución; en el 3 por ciento (26 enfermos) no se ha utilizado por ser los pacientes hipertensos (8), sinpaticotónicos (6), o por haberse utilizado soluciones comerciales de Novocaína Corbasil (12).

La adrenalina se ha utilizado en soluciones al $1 \times 100{,}000$ (una gota de solución de adrenalina oficinal por cada 20 cc. de solución anestésica). En ningún caso hemos observado isquemia duradera o esfacelo de los tejidos infiltrados; se ha utilizado aún para mover colgajos pediculados, no habiendo—hasta la fecha—encontrado ninguna contraindi-

cación. La duración de la isquemia adrenalínica es menor que la analgesia provocada por el clorhidrato, lo que a nosotros nos ha parecido una ventaja, pues nos ha permitido cohibir cualquier hemorragia existente antes de dar por terminada la operación; creemos, por tal motivo, que la tan temida "hemorragia secundaria" post-adrenalínica no tiene gran fundamento, sobre todo si se hace una revisión cuidadosa de las heridas y las atenciones post-operatorias son adecuadas.

Las ventajas de la anestesia local (comprendemos dentro de este término las analgesias parcelarias, local, regional, circundante, etc.) son indudables; disminuyendo el riesgo operatorio, reduce de una manera notable el período de invalidez postoperatorio, suprime la necesidad de un individuo en el "equipo" operante, reduce los gastos operatorios y permite una franca cooperación del paciente en el acto operatorio, lo que para nosotros es muy conveniente porque permite observar el resultado de una restauración plástica tanto en la actitud estática como en la dinámica, cosa indispensable en las operaciones de los labios, párpados, etc.

Una cosa que notábamos con cierta frecuencia era que el paciente se aterrorizaba al saber que iba a operársele con anestesia local: teníamos la costumbre de discutir, con el enfermo, los detalles de su intervención, ya que ello nos parecía necesario, pues tratándose de una operación plástica, estimabamos sensato darle beligerancia. Hemos comprobado posteriormente nuestra falta de razón: el paciente que va a someterse a una intervención plástica tiene un sólo interés: el ver corregido su defecto. Actualmente charlamos con él a propósito del resultado, hasta ponernos perfectamente de acuerdo, pero rara vez discutimos sobre los menesteres operatorios necesarios para obtenerlo; así, le aseguramos que no le molestará absolutamente su operación y no le damos explicación sobre la forma en que se hará su anestesia.

Tenemos la impresión de que la labor anestésica comienza desde varios días antes de la operación y, por eso, se le administra al enfermo durante el período preoperatorio una medicación sedante o hipnótica; por otra parte, se le procura poner en contacto con enfermos operados poco tiempo antes, los cuales le animan y le hacen ver el acto operatorio como algo perfectamente natural y del cual se sale fácil y satisfactoriamente. Esta "confianza por contagio" se ha mostrado verdaderamente útil para combatir el terror preoperatorio; ademas, tratamos de encamar al enfermo desde la víspera de la intervención para procurarle reposo físico y mental y un sueño agradable para lo cual se usan opiaceos y barbitúricos.

La llegada del enfermo a la sala de operaciones se hace de la manera más grata posible, no ha de ver ningún instrumento y todo el ritual preoperatorio ya se habrá desarrollado de antemano; siempre tenemos un pequeño aparato de radio sintonizado en una estación que nos procure música agradable y suave a fin de evitar el solemne y frío ambiente de la sala de operaciones; se acuesta al paciente, acomodándole cuidadosamente, y durante el tiempo de la operación *evitamos hablar de cosas que puedan sugerirle dolor o miedo,* solicitando los instrumentos con señas o signos.

El colorido en las salas de operaciones parece importante; indudablemente es más tranquila y agradable la estancia en una habitación con colores suaves y hasta alegres (rosa, verde, azul, naranja) que en una con colores muertos (negro, gris, blanco); otro tanto puede decirse de la ropa de operaciones.

En el mañana, se dá al paciente un desayuno ligero, consistente en un vaso

de jugo de fruta, una taza de cocoa y dos rebanadas de pan tostado con mermelada. Esto evita la hipoglicemia postoperatoria y dá sensación de comodidad al enfermo. Poco tiempo antes de la intervención, se le aplica una inyección del clorhidrato de dihídro-oxycodeinone (eucodal) de 0.02 acompañado de un analéptico cardiovascular en gotas o en inyección y dos capsulas de sodium pentobarbitale; media hora de espera basta para que el paciente esté tranquilamente dormido; se le transporta a la sala de operaciones, dormido ya, o en indiferente somnolencia, se toma su tensión arterial y si no hay depresión cardiovascular se le aplica una nueva dosis de eucodal, con lo cual se aumenta la profundidad del sueño y puede iniciarse la intervención sin que el enfermo se queje de ninguna de las maniobras que siguen.

Manos suaves y gentiles son indispensables ahora; los movimientos bruscos molestan; las pinzas de forcipresión han quedado abolidas en nuestra sala de operaciones para manejar tejidos, la presión de ellas hace sufrir al enfermo y traumatiza sus tejidos.

La infiltración de la solución anestésica se hace con *agujas finas de punta muy afilada,* motivo por el cual debe cambiarse frecuentemente las agujas de la sala de operaciones. Para intervenciones en pequeñas áreas, en sitios donde el tejido es laxo, puede usarse la jeringa ordinaria. Para zonas pequeñas en sitios donde el tejido es compacto y cerrado (encías, nariz, cuero cabelludo) es cómodo utilizar le jeringa con aros de apoyo para los dedos con ajuste de bayoneta o del tipo americano (Becton Dickinson). Para inyectar la solución en áreas extensas, es útil el empleo de la jeringa de doble corriente, esto ahorra tiempo y solución anestésica, a cuyo fin empleamos la jeringa Pitkin (de Becton Dickinson) ordinaria o la automática; la solución la preparamos en copas de 100 cc. agregando la adrenalina en esa medida y precisamente antes de utilizarla; de esta manera ahorramos solución, ya que si se prepara gran cantidad añadida de adrenalina y no se utiliza, no podría usarse posteriormente por la oxidación de la misma.

Hay ocasiones en que el uso de la adrenalina está contraindicado, en tales casos nos ha parecido que tiene ventajas la producción de "isquemia por enfriamiento," para lo cual, desde tres horas antes de la intervenció aplicamos en el área en que se va a operar una bolsa de hielo (añadido de cloruro de sodio). Hemos de anotar que en los últimos casos operados en estas condiciones, se ha cambiado la concentración de la solución, haciéndola más baja que la normal para ese caso, a pesar de lo cual la regularidad de la analgesia se ha mantenido.

La vasoconstricción producida por enfriamiento es uniforme y por los casos en que la hemos utilizado tenemos la impresión que en su efecto y en su duración es muy semejante a la vasoconstricción producida por la adrenalina. En lo futuro vamos a utilizar este medio físico de isquemia local en algunas operaciones largas en las que actualmente usamos la concentración de novocaína al 2 por ciento más adrenalina y en las que por su gran duración se tiene analgesia insuficiente en tiempo; por este medio creemos poder ayudar tales casos.

La infiltración anestésica la comenzamos haciendo "papulas de analgesia" retiradas una de otra poco menos de la longitud útil de la aguja, y a una distancia relativamente grande del área operatoria; esto evita molestias al paciente aún en el momento de despegar la piel para favorecer la movilidad de la misma.

Para ahorrar tiempo en los casos en que había que infiltrar grandes áreas, hemos aprovechado una idea que reci-

bimos de Kirschner en su libro de técnica operatoria, donde se recomienda el uso de un aparato para infiltrar la anestesia a presión. Dicho aparato es sumamente complicado, pero la idea nos pareció buena; para ello se usó un matraz con la solución de clorhidrato de procaína y cargado a presión con bióxido de carbono; el resultado dejó mucho que desear ya que la presión disminuía a medida que entraba el líquido y carecía por completo de uniformidad. En vista de esto se nos ocurrió un dispositivo que dió un resultado mejor, pero que las ventajas de la jeringa de doble corriente, que utilizamos actualmente, nos hicieron abandonar.

La anestesia local, en las concentraciones indicadas anteriormente, produce analgesia en un período que oscila entre sesenta y noventa minutos; con preparación adecuada hemos llegado, en ocasiones, a la segunda hora de intervención sin que el paciente muestre señales de sufrimiento, pero en otros casos, al llegar a ese tiempo, se inicia un período de inquietud y de franca hiperestesia que a veces no cede a una nueva infiltración de procaína; para tales casos se inició el uso de anestesia general por vía intravenosa. Este método ha sido satisfactorio cuando lo hemos usado como anestesia de base para casos fuera de la cavidad nasal o bucal; en varias ocasiones en que fué usado como "anestesia de suplemento" (10) para operar en la cavidad nasal o oral, hubo serios fenómenos de colapso respiratorio (5) que en tres ocasiones llegaron al síncope; para combatirlo, hicimos respiración artificial por dos o tres minutos e inyección Picrotoxina y de coramina por vía intravenosa. Por tales motivos no continuamos su uso y en su lugar aplicamos, a la hora media del período operatorio, una nueva inyección de eucodal de 0.02, que se repite a la media hora (si es necesario), inyectando al mismo tiempo algún analéptico cardiorespiratorio. El uso de tales dosis de morfina no origina ninguna molestia posterior; el paciente duerme tranquilo cinco o seis horas o aún más después de la operación, disminuyendo asi gran parte de los transtornos postoperatorios inmediatos.

Uno de los inconvenientes que se le han achacado a la anestesia local, especialmente en el campo de cirugía plástica, es la distorsión que produce al infiltrar los tejidos; tal cosa no es un inconveniente si se ha tenido la precaución de marcar antes de la intervención los puntos de referencia con alguna tinta indeleble, v.gr. solución alcohólica de verde brillante a saturación. De esta manera el edema anestésico no deforma el área operatoria y sí ayuda, produciendo una zona ligeramente más consistente y en la cual se puede incidir con facilidad.

Hasta la fecha no hemos visto ningún accidente atribuible a la anestesia local; tales accidentes parecen deberse a la inyección intravenosa incidental de novocaína y sus características sintomáticas se refieren principalmente a alteraciones en el centro respiratorio y en el aparato vaso-regulador, sobreviniendo un cuadro típico de shock, con intensa dispnea, palidez, opresión precordial, sudor frío, pulso filiforme y en ocasiones muerte.

Como medidas de precaución usamos las siguientes: (1) inyectar la solución al ir avanzando la aguja (con lo cual cualquier pequeño vaso que se encuentra en el camino es rechazado por la fuerza de la solución); (2) aspirar antes de inyectar.

Parece ser que los barbitúricos tienen una acción electivamente antitóxica; la inyección intravenosa de luminal puede ser útil añadida de analépticos cardiorespiratorios y las otras medidas curativas del shock.

La anestesia regional se ha utilizado

en algunas ocasiones, especialmente en casos en los que la infiltración local se considera difícil o molesta (v.gr. uranoestafilorrafia). Si la técnica para localizar el tronco nervioso es correcta, la anestesia de este tipo es muy satisfactoria y dá un período analgésico de una hora y media o dos horas. Para estos casos se ha utilizado procaína al 2 por ciento añadida de adrenalina; recomendamos muy especialmente no inyectar hasta tener la seguridad de "tener el nervio en la punta de la aguja" o en su proximidad, lo cual se sabe por la producción de un intenso dolor fulgurante en el momento en que se toca al nervio. De no observar esta regla, la analgesia es irregular y no puede dependerse de ella ni en intensidad ni en duración.

Cuando es preciso conservar lo solución de procaína por un período de tiempo largo nos ha dado buenos resultados esterilizarla, según el siguiente proceder: El agua destiliada se hace hervir por diez minutos, al cabo de los cuales se añade el clorhidrato de procaína en la cantidad necesaria y se deja hervir por tres minutos más; para conservarla se aplica un tapón de gasa y sobre él se coloca un trozo de gasa o un cuadrado de papel estéril, sobre el cual se aplica otro mayor de papel estaño estéril que se sostienen en sitio con una liga. De esta manera, la solución puede permanecer útil por un tiempo indefinido.

Los cuidados postoperatorios no dejan de tener importancia; sugerimos la aplicación rutinaria de apósito compresivo, el cual contrarresta la tendencia de la herida a "aflojarse" en cuanto desaparece el edema.

SUMMARY

The author describes his experience in 867 operations performed with local anesthesia induced with procaine hydrochloride, in different concentrations according to the site of operation. In 841 cases epinephrine was added to the anesthetic solution. This drug was not used for hypertensive or sympathicotonic patients or with certain commercial solutions of procaine. In no case was lasting ischemia or gangrene of the infiltrated tissues noted. The dreaded "secondary hemorrhage" following administration of epinephrine is really not important if careful postoperative inspection of the wound is carried out and if postoperative care is adequate.

The advantages of local anesthesia are the following: It decreases the operative risk, shortens the period of postoperative invalidity, eliminates the necessity for an extra person on the surgical team, reduces the expense of the operation and permits the cooperation of the patient in the surgical procedure. The last factor is especially important in plastic repairs in which it is necessary to take into account both the static and the dynamic relations (operations on the eyelids, lips, etc.).

A patient is frightened when he learns that he is going to be operated on under local anesthesia; for this reason the type of anesthesia to be used should not be mentioned when he is being prepared for the operation. The work of anesthetization begins several days before the operation, and in the preoperative period the patient is given a sedative or hypnotic drug and in addition is afforded contacts with other persons who have recently been operated on, so that he may gain confidence ("confidence by contagion"). The evening before the operation the patient is put to bed and a pleasant sleep is induced by means of opiates and barbiturates.

It is important that every sensation of discomfort be eliminated for the patient. In the morning he is given a light breakfast, and a little while before the

operation an injection of eucodal (dihydrooxycodeinone hydrochloride) (0.02) is administered, accompanied with a cardiovascular analeptic and 2 capsules of pentobarbital sodium. It is essential that the operative manipulations be made smoothly and delicately and that the use of instruments like pressure forceps be avoided. Instruments should be requested by means of signs or signals.

The anesthetic is introduced with very fine needles, and the choice of syringe depends on the site of the infiltration. The solution is prepared in quantities of 100 cc., with epinephrine added. One should not prepare an excess, since the solution is not resistant to oxidation. To save time in infiltration of large areas, one may make use of the principle of infiltration by pressure, introduced by Kirschner; it is better, however, to use a syringe with double barrel.

In some cases the duration of the anesthesia has been prolonged into the second hour without the patient showing signs of unfavorable reaction; in other instances the patient begins to be restless and has a spell of obvious hyperesthesia, which sometimes does not yield to a new infiltration of procaine. In such cases one must resort to general anesthesia induced by the intravenous route.

The author describes the disadvantages of this method of local anesthesia and the procedure which can be substituted. Finally, he describes the precautionary measures which should be employed with this kind of anesthesia.

RÉSUMÉ

L'auteur nous décrit son expérience dans 867 cas d'anesthésie locale à l'aide de l'hydrochlorure de procaïne employée en différents concentrations, selon le siège de l'acte opératoire. Dans 841 cas, on ajouta de l'épinéphrine à la solution anesthésiante. Cette drogue ne fut employée ni chez les hypertensifs ni avec certaines solutions commerciales de procaïne. Dans aucun cas, on ne nôto ni une ischémie prolongée ni la gangrène des tissus infiltrés. Il ne survient aucune hémorrhagie secondaire sérieuse consécutive à l'emploi d'épinéphrine si on inspecte soigneusement la plaie ou quand les soins postopératoires de la plaie sont adéquats.

Les avantages de l'anesthésie locale sont: 1. Le risque opératoire est moindre. 2. La période d'invalidisme postopératoire est abrégée. 3. Il y a élimination d'un aide. 4. Le coût de l'opération est diminué. 5. La coopération de l'opéré est obtenue.

Il n'est pas sage d'avertir le malade qu'on va employer l'anesthésie locale. La période de préparation du malade dure quelques jours. Dans cette période préopératoire, on donnera au malade des sédatifs ou des hypnotiques et on le mettra en contact avec d'autres malades qui one été récemment opérés, afin de lui inspirer confiance (''confiance par contagion''). La veille de l'opération on procurera au malade une bonne nuit de sommeil au moyen de la morphine ou des barbiturates.

Il faut éliminer toute sensation de malaise chez le malade. Le jour de l'opération, on lui donnera un léger déjeuner; peu avant l'acte opératoire on lui administera une injection de eucodal (dihydrooxycodeînone hydrochlorure) accompagnée d'un analeptique cardiaque at de deux capsules de sodium pentobarbital. Il est essential que les manipulations opératoires soient délicates et douces. On demandera les instruments par signaux et non par paroles.

L'anesthésique est introduit à l'aide d'une aiguille très fine. On choisit la

seringue selon le siège de l'infiltration. On prépare la solution en quantité de 100 cc. avec épinephrine. La solution ne resiste pas à l'oxidation. Pour anesthésier des régions de grande étendue, on peut infiltrer sous pression, d'après la méthode de Kirschner; il est préférable néanmoins d'employer une seringue à deux cylindres.

Dans certains cas, l'anesthésie a été prolongée près de deux heures sans réactions défavorables. Dans certains cas le malade a une crise d'hyperesthésie qui ne cède pas à une nouvelle infiltration de procaïne. Dans ces cas on a recours à l'anesthésie générale obtenue par voie intraveineuse.

L'auteur décrit les désavantages de cette méthode d'anesthésie locale et les procédés qu'on peut lui substituer. Il nous donne aussi les précautions qu'on doit observer quand on a recours à cette méthode d'anesthésie locale.

Свод

Автор описывает свой опыт в 867 операциях при местной анэстезии прокаином (procainae hydrochloridis) в разных концентрациях в зависимости от места операции. В 841 случаях к раствору был добавлен адреналин. Он не употреблялся для гипертенсивных и симпатотонических больных или же с некоторыми коммерческими растворами прокаина. Ни разу не была причинена продолжительная исхемия или гангрена инфильтрованных тканей. Постоянно пугающее "вторичное кровоизлияние" после применения адреналина в действительности не так важно, если сделан старательный послеоперационный осмотр раны и дан адэкватный послеоперационный уход.

Преимущества местной анэстезии следующие: она уменьшает оперетивный риск, сокращает период послеоперционного инвалидизма, исключает необходимость лишнего члена хирургического состава, уменьшает расход, дает возможность пациенту кооперировать в хирургической работе. Последний фактор особенно важен в пластических операциях, при которых необходимо принять во внимание как статичное, так и динамичное отношения (операции век, губ и т.д.).

Больной обыкновенно пугается, когда он узнает, что он будет оперирован под местной анестезией. Поэтому не нужно упоминать тип анэстезии пока пациент подготовляется к операции. Работа анэстезации начинается за несколько дней до операции, больному даются седативы и помимо этого он помещен в соприкосновение с другими недавно оперированными больными, так, чтобы в нем появилось доверие ("заразное доверие," confidentia per contagione). Накануне операции пациент идет спать под влиянием барбитуратов и препаратов опия.

Необходимо предотвратить всякое неприятное ощущение. Утром дается легкий завтрак и, перед операцией, укол eucodal'a, 0.02 (dihydrooxycodeinone hydrochloride), кардиоваскулярный аналептик и две капсюли pentobarbital sodium. Оперативные манипуляции должны быть ровными и деликатными и необходими избегать употребление таких инструментов, как придавливающие клемпы.

Раствор вводится очень тонкими иголками. Выбор шприца зависит от места инфильтрации. Раствор приготовлен в количестве 100 к.см. а затем добавляется адреналин. Много готовить не советуется, так как раствор окисляется.

Чтобы сохранить время при инфильтрации большого поля можно применить принцип инфильтрации давлением по Kirshner'у; но лучше употребить двойной шприц.

В некоторых случаях анэстезия продолжалась во второй час и все же пациент не проявлял никакой неблагоприятной реакции; в других случаях больной делается беспокойным и проявляет чувствительность, которая не поддается новой инфильтрации прокаином. В таких случаях необходимо прибегнуть к общей анэстезии введенной интравенозным путем.

Автор описывает недостатки этой методы местной анэстезии и дает другие способы. Также он описывает предупредительные меры, необходимые при применении этого типа анэстезии.

LA "Revista del Colegio Internacional de Cirujanos" *(The Journal of the International College of Surgeons)* es una publicación bimestral que constituye el órgano oficial del referido Colegio (fundado en Ginebra, Suiza, en 1935). En esta revista se publican artículos originales de investigación, observación clínica y trabajo experimental sobre temas quirúrgicos. Sirve, además, como vehículo para dar a conocer las actividades del Colegio Internacional de Cirujanos a sus miembros y a todos aquellos que se interesen por los adelantos e innovaciones de índole quirúrgica en el mundo entero.

Los Capítulos Latino-americanos del Colegio Internacional de Cirujanos tienen en ésta revista el medio oficial en que se recogen sus actividades. Actualmente la revista se halla enriquecida por una Sección especial en español en la que se publican no sólo trabajos científicos originales de cirujanos de Hispano-América sino tambien noticias referentes a los miembros y Capítulos de los paises de habla española, así como una información general en relación con la cirugía. A todos aquellos profesionales, cirujanos y médicos, que se interesen por los temas quirúrgicos habrá de serles de gran utilidad el subscribirse a ésta publicación.

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¿Quienes Introdujeron el Algodón en Cirugía?

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EL célebre cirujano de la India, Susruta (siglo V d. de C.), expresó con profundidad de pensamiento, que "la mano del cirujano era el mejor instrumento de la cirugía."

La cirugía, en efecto, es la "obra o trabajo de la mano," desde el punto de vista terapéutico. La mano del hombre . . .! Instrumento maravilloso con el que se han ejecutado obras grandiosas, sublimes, pero también actos demasiado trágicos y horrendos!

Aquel genial griego, campeón del finalismo, que hizo su nombre sinónimo de médico, Galeno (131–210), no pudo contener su asombro al conocer las maravillas que el estudio de la mano le revelaba y afirmó, lleno de convencimiento, que la mano probaba elocuentemente la existencia de Dios.

No obstante, si la mano es el instrumento esencial del cirujano, necesita para realizar sus maravillas terapéuticas, de un conjunto de adyuvantes, de cosas auxiliares, que denominamos "material quirúrgico": hierro, acero, telas, hule, cristal, yeso, etc., que convenientemente preparados y adaptados, son absolutamente indispensables para la obra quirúrgica perfecta.

La cirugía constituye parte integrante del progreso, de tal importancia que los adelantos de muchas industrias han hecho avanzar grandemente a la cirugía.

Entre los integrantes del material quirúrgico, el algodón absorbente es de una utilidad tan grande que bastaría suprimirlo mentalmente, para convencernos de las dificultades e imperfecciones que sufriría la primera y más noble de todas artes: la cirugía!

Por lo cual creo que es no sólo cuestión de curiosidad, sino de elevación cultural y de gratitud, interesarse por conocer a las personas que introdujeron el uso del algodón en cirugía.

La historia de la medicina es una rama enorme de la historia del progreso, por lo cual no llama mucho la atención, que los historiadores, por muy eruditos que sean, dejen de incluir en sus historias ciertas cuestiones que "les parecen" secundarias. El caso es que yo no he podido hallar nada que se refiera a los introductores del uso del algodón en cirugía, en ninguna de las historias de la medicina y aun de la cirugía, que he consultado: Garrison, Castiglioni, Diepgen, Graham, Leonardo, etc.

El algodón, como sabemos, es una borra o pelusa blanca y muy larga, que envuelve las quince o veinte semillas que encierra una cápsula; ésta constituye el fruto de la planta malvácea de flores amarillas, con manchas encarnadas, que se llama también, algodón, o más propiamente, algodonero. Esta planta es originaria de la India y su utilización industrial es muy moderna, representando actualmente una riqueza inmensa, pues el algodón es la base de muchas industrias, siendo una de ellas la preparación del *algodón hidrófilo y esterilizado* para usos médicos!

Un hecho que estimo cierto es el siguiente: no se menciona el uso del algodón, en cirugía, en libros de la anti-

güedad, de la edad media, ni siquiera de la edad moderna.

Lo que se empleaba en esos tiempos para hacer curas eran hilas y fragmentos de tela de diferentes clases, que eran filamentos y retazos de telas y ropas, generalmente usadas . . .!! Esto tenía, entre otros inconvenientes, el de ser infectantes y nada o muy poco absorbentes. Los franceses denominaban a esos materiales de cura, "charpie," palabra que procede del antiguo idioma francés y que significa en realidad, "pedacería" (hacer pedacitos). El uso de estas hilas y trapos en cirugía, es antiquísimo: baste decir que los menciona Hipócrates (siglo V a. de C.).

Para canalizar las fístulas y llagas profundas, se introducían en ellas hacecillos o manojos de hilas torcidas entre sí: estos eran los famosos lechinos, que se usaron durante siglos. Estas hilas atraían los líquidos patológicos hacia el exterior, obrando por capilaridad.

El uso de hilas, lechinos y trapos, con frecuencia sucios, empezó a abandonarse en la segunda mitad del siglo XIX, es decir, en plena edad contemporánea! Esto se debió precisamente al invento e introducción en cirugía del algodón hidrófilo.

La información más lejana y enteramente seria que poseo a este respecto y que pongo a disposición de mis ilustrados colegas para su crítica, es la siguiente:

El médico francés Auguste Tourainne presentó a la Sección médica de la Comisión científica un trabajo titulado "Note sur le coton hydrophile," cuyo trabajo aparece publicado en el periódico de esa sección, o sea en la *Gaceta médica de México,* en el tomo I, no. 7, páginas 105–109, con fecha 15 de diciembre de 1864.

En ese estudio, Tourainne nos dice que ya pasó el tiempo en que se miraba al algodón como producto maléfico, capaz de engendrar todos los males: peste, carbón, fiebre amarilla, etc., y que, a pesar del clamor popular, los tejidos de algodón se han hecho de uso universal. En cambio, costó mucho trabajo para que se aceptara en cirugía y esto se logró gracias a la energía y tenacidad de Mayor, quien hizo ver la inocuidad del algodón, logrando popularizarlo en medicina.

Matias Luis Mayor (1775–1846) fué un notable cirujano suizo, que escribió numerosas e interesantes obras, siendo particularmente conocido por su cauterización por medio de un martillo, mojado en agua hirviendo (martillo de Mayor, 1829).

Los enemigos del uso del algodón en cirugía, entre los que se contaban los más distinguidos cirujanos, le reprochaban a Mayor que su decantado algodón era inútil, ya que no absorbía ningún líquido. Mayor usaba el algodón cardado común y Tourainne se propuso estudiar el problema de la falta de poder absorbente de ese algodón.

Nos refiere que fué testigo, en 1852, del esfuerzo que se hizo en los hospitales de París, a fin de utilizar varias veces, después de lavarlos, los pedazos de trapo que se denominaban "charpie"; esfuerzo inútil: estos se echaban a perder rapidamente, después de estar en contacto con el agua, *apelmazándose,* haciéndose un masacote, que se desintegraba, finalmente, con las manipulaciones. Estos ensayos se hicieron en París debido a que se dejó sentir la escasez de hilas y trapos para las curas.

En 1855, en los hospitales de Constantinopla, Tourainne logró reemplazar la "charpie" por algodón tratado por la lejía y sometido a algunas maniobras, que lo hacían muy absorbente, debido probablemente a que los álcalis disolvían ciertas sustancias grasosas de la pelusa de algodón. A este producto

lo denominó algodón hidrófilo, y en 1857 publicó una nota sobre el resultado de sus experimentos.

Describe la manera de usar el algodón hidrófilo, su superioridad sobre las hilas y trapos y el modo de prepararlo, resumiendo así sus ventajas: es económico, abundante, de servicio indefinido, evita el contacto del aire, mantiene uniforme la temperatura del sitio lesionado, absorbe los líquidos excretados y no hay peligros de contagio, ya que los álcalis (lejía) destruyen los virus.

Como Tourainne proponía a la Comisión que se reemplazaran las hilas y trapos por su algodón hidrófilo, ésta nombró a los eminentes cirujanos, Luis Hidalgo y Carpio (1818–1879) y José María Barceló y Villagrán (1819–1872) para que estudiaran el asunto y rindieran un informe. Este fué presentado después de minuciosa observación, resultando no sólo favorable, sino elogioso para el Dr. Tourainne. Es importante tener presente qui Tourainne publicó su "Nota acerca del algodón hidrófilo," el 15 de diciembre de 1864; pero varios meses antes la había dado a conocer a la Sección Médica de la Comisión científica, supuesto que el dictamen de Hidalgo Carpio y de Barceló y Villagrán, está fechado el 7 de septiembre de 1864 (*Gaceta Médica de México,* 1864, tomo I, páginas 103–104).

Por consiguiente, por agosto de 1864 se empezó a usar en México, el algodón absorbente, con fines terapéuticos. ¿Cuáles serán las fechas en que se introdujo el uso del algodón absorbente, en cirugía, en las demás repúblicas de América? Quizás México tenga en esto la primacía, de honroso origen francés.

Este utilísimo invento se fué perfeccionando rapidamente y los industriales lograron poner en manos de la profesión médica el algodón hidrófilo perfecto, por el año de 1887, valiéndose de manipulaciones físicas y químicas, bastante complejas.

Para terminar debo advertir el error en que están ciertos autores, que consideran al notable cirujano francés Alphonnse François Marie Guérin (1817–1895) como el introductor del algodón en cirugía.

Guérin publicó en 1847 su obra titulada, "Sur la fiévre purulente," en la que sostenía la doctrina de que la septicemia se debía a la penetración en el organismo de corpúsculos animados que existen en el aire. En la guerra franco-alemana de 1870, llevó a la práctica su doctrina, aislando las heridas del aire, por medio del algodón en rama, para evitar la infección.

Hasta 1885 publicó su famosa obra "Du pansement ouaté et de son application à la thérapeutique chirurgicale" cuando ya el uso del algodón hidrófilo de Tourainne era universal.

Siento no haber podido encontrar más datos acerca de la personalidad del ilustre Dr. Auguste Tourainne.

SUMMARY

The author reviews the historical background of the use of cotton in surgery and points out that he has not been able to find anything about the introduction of this material into surgical practice in any of the histories of medicine or surgery which he has consulted. He describes the structure of the cotton plant, which originated in India. He discusses the extensive modern industrial use of cotton and emphasizes especially the medical use of hydrophilic, sterilized cotton. He says that the use of this material is not mentioned in the books of the ancient or medieval period and is given little attention in modern literature.

He continues with a discussion of the former therapeutic use of fibers and

fragments of fabrics of different kinds, material which was known in France by the name *charpie*. In order to canalize and drain deep lesions, the famous *lechinos* were used, but these were abandoned in the second half of the nineteenth century as a result of the introduction of hydrophilic cotton.

The first author to report on the use of cotton in surgery was Tourainne, in 1864. Mayor, the famous Swiss surgeon, used combed cotton, and Tourainne studied the lack of absorptive power of this material. In 1855 this surgeon succeeded in replacing *charpie* by cotton treated with lye and subjected to certain procedures which made it more absorbent. The claims of Tourainne were verified by a committee composed of the surgeons Hidalgo and Barcelo, and absorbent cotton began to be employed in Mexico in 1864.

The author points out that Guerin was not responsible for the introduction of the use of cotton in surgery, as certain authors have erroneously reported.

RÉSUMÉ

L'auteur nous donne l'historique de l'emploi du coton en chirurgie et nous dit qu'il n'a pu obtenir aucun rensignement sur l'emploi de cette matière en chirurgie dans les nombreux ouvrages de chirurgie et de médecine qu'il a consultés. Il nous décrit la structure du cotonnier, plante originaire de l'Inde. Le coton est employé en grande quantité dans l'industrie. En médecine on fait un grand usage de coton hydrophile stérilisé. Les livres de l'antiquité et du moyen age n'en parlent pas, et même ceux de nos jours ne lui donnent que peu d'attention.

Il discute l'emploi thérapeutique de différents fibres et fabriques, matériels désignés en France sous le nom de "charpie." Pour le drainage et la canalization les "lechinos" furent employés. On abandonna leur emploi dans la seconde moitié du dix-neuvième siècle lors de l'introduction du coton hydrophile.

Tourainne est le premier auteur qui nous parle (en 1864) de l'emploi du coton en chirurgie. Mayor, le célèbre chirurgien suisse, fit emploi du coton peigné, et Tourainne étudia le manque d'absorption de ce coton. En 1855 Tourainne remplaça la charpie par un coton soumis à l'action de la lessive et à certains procédés qui rendèrent ce coton absorbant. Les chirurgiens Hidalgo et Barceló confirmèrent les communications de Tourainne, et on commença l'emploi du coton hydrophile au Méxique en 1864.

L'auteur nous affirme que Guérin n'a pas introduit l'emploi du coton en chirurgie.

Свод

Автор дает исторический обзор хирургического употребления ваты и обращает внимание на то, что в историях медицины и хирургии, с которыми он справлялся, он не нашел ни одной справки о введении этого материала в хирургическую практику. Он описывает строение ваточного растения, которое происходит в Индии. Он обсуждает широкое модерное промышленное применение ваты и особенно подчеркивает медицинское употребление гигроскопической, стерилизованной ваты. Он говорит, что употребление этого материала не упомянуто в книгах древнего или средневекового периода и мало упомянуто в новой литературе.

Затем следует дискуссия о старом терапевтическом употреблении волокон и обрывков тканей разных сортов, которые были известны во Франции под именем корпии. Для канализации и дренажа глубоких повреждений употреблялись знаменитые "lechinos," но после введения во второй половине 19-го столетия гигроскопической ваты, этот способ был оставлен.

Первым автором сделавшим доклад о

(Continua en página 501)

NOTICIAS y ANUNCIOS

Facilidades para Médicos Iberoamericanos Que Llegan a los Estados Unidos.—En la Academia de Medicina de Neuva York existe una sección denominada Inter-American Bureau of Medical Information, cuyo objeto es procurar toda clase de facilidades a los médicos iberoamericanos que llegan a los Estados Unidos, con deseos de ampliar sus conocimientos.

La Academia también mantiene en la Quinta Avenida y calle 103, New York, una exposición permanente de los productos farmacéuticos y medicamentos fabricados por las principales casas de los Estados Unidos, con fines culturales y no comerciales.

La Academia de Medicina de Nueva York y su Biblioteca, una de las más nutridas del mundo, invitan cordialmente a todos los médicos iberoamericanos a que visiten la Academia, asistan a sus reuniones cientificas y pidan cuanta información necesiten.

Sociedad Venezolana de Cirugía.—El 16 de marzo se efectuó la sesión inaugural de la Sociedad Venezolana de Cirugía en el Paraninfo de la Universidad Central. Una nutrida concurrencia entre le cual se encontraban altas personalidades de círculos científicos y sociales de Venezuela prestigió el solemne acto cultural en donde pronunciaron vibrantes discursos el Dr. Domingo Luciani, Presidente de la Sociedad, y el Dr. Salvador Córdoba, orador de orden.

El Dr. Francisco Nájera, F.I.C.S. (Hon.), que durante varios años fué Embajador de México en los Estados Unidos de América, ha sido designado Secretario de Relaciones Exteriores de los Estados Unidos Mexicanos.

Primer Congreso Internacional de Neurocirugía.*—Entre el 1 y el 4 de marzo del presente año, se llevó a efecto en Montevideo el Primer Congreso Internacional de Neurocirugía, auspiciado por el Gobierno del Uruguay y por la Universidad de Montevideo.

Presidente del Congreso fué el Prof. Alejandro Schroeder y el Prof. Agregado Dr. Román Arana, Secretario General.

Desde todo punto de vista, el Congreso fué un éxito absoluto. Asistieron delegaciones de la mayoría de los países sudamericanos; se presentaron más de 120 trabajos, que representaban el sentir y la labor de los diversos Servicios de Neurocirugía que existen en Sudamérica y—además—hubo conferencias a cargo de los Profs. Castex, Houssay y Clemente Estable. La delegación chilena que iba en representación de las Instituciones Asistenciales del pais, además del de la Sociedad de Cirujanos de Hospital, estuvo formada por los Dres. Alfonso Asenjo y Mario Contreras e integrada por los Becados Dres. Esteban D. Rocca y Francisco Rubén Perino, tres de ellos socios de nuestra Institución. Este Congreso sirvió para unir a todos los neurocirujanos y, al lado de la gran importancia científica y profundidad de los trabajos que se presentaron, hubo también una intensa actividad social, debida a la amabilidad de los organizadores. Las misiones extranjeras fueron recibidas por el Presidente de la República, por el Ministro de Instrucción y por el Ministro de Salubridad. La delegación chilena tuvo la inmensa satisfacción de recibir el honor de que, por unanimidad, se acordara que la sede del próximo Congreso fuera Santiago de Chile, en abril de 1947.

El Instituto Central de Neurocirugía y Neuropatología ha iniciado ya las gestiones para darle a este Congreso todo el brillo que merece. Los temas a tratar serán:

a) Tratamiento de los abscesos del cerebro.
b) Hidrocefalias y
c) Relación entre la clínica y la histología de los gliomas.

A raíz del Congreso, la delegación chilena fué invitada a dar conferencias en Rio de Janeiro, San Pablo y Porto Alegre.

III Congreso Americano de Cirugía.*—Los cirujanos de la República Oriental del Uruguay han decidido celebrar en 1946 el III Congreso Americano de Cirugía.

Uno de los miembros más prominentes de la Sociedad de Cirujanos del país vecino, el Dr. Fernando Etchegorry, ha estado de paso por los diferentes países sudamericanos compulsando las opiniones y dando a conocer la

* Reproducido de los Archivos de la Sociedad de Cirujanos de Hospital (Santiago de Chile), junio de 1945.

* Reproducido de los Archivos de la Sociedad de Cirujanos de Hospital (Santiago de Chile), junio de 1945.

forma en que se llevará a cabo dicho Congreso. El Dr. Etchegorry, que cuenta con una amplia simpatía en todos los círculos quirúrgicos sudamericanos, fué festejado especialmente por la Sociedad de Cirujanos de Chile, ya que ella ha sido la entidad que ha impulsado en forma más entusiasta la celebración de este próximo Congreso. El Dr. Etchegorry fué recibido en una Sesión especial por el Directorio de la Sociedad, y un grupo de ex-presidentes le ofreció una comida en que se brindó por el éxito del Congreso aludido. El Dr. Julio Bahr, Presidente de la Sociedad de Cirujanos de Hospital, atendió especialmente al Dr. Fernando Etchegorry.

Los temas que se discutirán en el III Congreso Americano de Cirugía, son los siguientes:

1—Fractura de la pelvis (tratamiento).
2—Tratamiento quirúrgico del cáncer del esófago, y
3—Cirugía de las vías biliares (complicaciones y secuelas).

Del 4 al 7 de Diciembre se celebrará en Santiago de Chile el VII Congreso Chileno de Cirugía y la XIV Semana de la Experiencia Quirúrgica. Los temas oficiales versarán sobre el cáncer del recto, shock, ectopia testicular y cirugía de la esterilidad en la mujer. Serán Relatores en este Congreso los Drs. Middleton, Piña, Estevez, Yodice, Urrutia, Abud y Cruz.

El Congreso acepta contribuciones a los temas oficiales y, además, habrán Sesiones especiales para temas libres y cinamatografía.

¿QUIENES INTRODUJERON EL ALGODÓN EN CIRUGÍA?

(Continuación de la página 499)

хирургическом применении ваты является Tourainne, в 1864 году. Mayor, знаменитый швейцарский хирург, употреблял чесанную вату, и Tourainne изучал недостаток впитывающего свойства этого материала. В 1855 году этот хирург сумел заменить корпию ватой, обработанной щелочью и подвергнутой различным процессам, сделавших ее более впитывающей. Его заявления были подтверждены комиссией состоящей из хирургов Hidalgo и Barcelo, и в 1864 году гигроскопическая вата начала употребляться в Мексике.

Автор обращает внимание на то, что Guerin'y не принадлежит честь введения хирургического употребления ваты, как ошибочно доложили некоторые авторы.